Draft Report
2003 City of Franklin
Bicycle and Pedestrian Plan Update

May, 2003

Revised June, 2003

CITY OF FRANKLIN

TENNESSEE

PREPARED BY:

RPM TRANSPORTATION CONSULTANTS, LLC
BRENTWOOD, TENNESSEE

Draft Report
2003 City of Franklin
Bicycle and Pedestrian Plan Update

May, 2003
Revised June, 2003

PREPARED FOR:
THE CITY OF FRANKLIN, TENNESSEE

PREPARED BY:
RPM TRANSPORTATION CONSULTANTS, LLC

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER ONE: INTRODUCTION & PLANNING PROCESS

Bicycling is the most energy-efficient form of transportation.

Walking is the most basic form of transportation.

INTRODUCTION

Bicycling is the most energy-efficient form of transportation. It is inexpensive, non-polluting, quiet, and healthy. It is also fun. Walking, which also possesses these qualities, is the most basic form of transportation. However, most adults continue to rely on motor vehicles for most of their transportation needs. As a result, many communities are experiencing increases in traffic congestion, pollution, and health care costs.

Providing a balanced, multi-modal transportation system that includes bicycle and pedestrian facilities can reduce the negative effects that are caused by motorized transportation. When these efforts are combined with public awareness messages that promote bicycling and walking, there is a high potential to shift many motorized trips to bicycling or walking. These efforts also have a positive effect on people's attitudes about a community. Communities that support bicycling and walking are perceived to be more livable and more attractive than those that focus on motorized transportation.

Bicycle-friendliness and walkability have become two common measures of quality of life in communities throughout the United States. Towns where bicycling and walking are safe, comfortable, and popular modes of transportation share some common characteristics:

- The pedestrian and bicycle infrastructure connects destinations and provides direct routes between destinations.
- Facilities offer safety, comfort, and continuity.
- Hazards, obstructions, modal conflicts, and other barriers to bicycle and pedestrian travel have been minimized.
- Carefully designed intersections allow one to not only travel along a street, but also to safely cross it.
- Homes are within reasonable bicycling or walking distance of other destinations, such as schools, shopping centers, and employment centers.
- Bicycle and pedestrian facilities have been integrated into the design and funding of larger roadway projects.

Some of these characteristics can already be found in the City of Franklin. For example, many residential developments are located within proximity of the commercial developments in the Cool Springs area and in downtown Franklin. Franklin requires that sidewalks be constructed in new residential and commercial developments. Franklin has also included bicycle facilities in some of its recent and planned roadway projects. In addition, many of Franklin's curb-and-gutter roadways already have bicycle-safe grates. The *2003 City of Franklin Bicycle and Pedestrian Plan Update (2003 BPPU)* will focus on expanding the existing bicycle and pedestrian facilities in Franklin to provide a safe, well-designed network that connects popular destinations and is accessible to everyone in Franklin.

One of the purposes of this plan is to ensure that new roads are designed to accommodate bicyclists and pedestrians. Boyd Mill Avenue is an example of a roadway that fulfills this multi-modal function.

PURPOSE OF THE PLAN

The purpose of the *2003 BPPU* is to increase mobility, promote additional transportation choices, and promote a higher quality of life by establishing safe, accessible, efficient, and desirable bicycle and pedestrian facilities. Comprehensive in scope, this plan addresses the following objectives:

- To provide safe and attractive bicycle and pedestrian facilities that connect popular destinations and that are accessible to all people, regardless of their skills or physical abilities
- To maximize the multi-modal function of existing streets and ensure that new streets are designed to accommodate bicyclists and pedestrians
- To minimize conflicts between motorists and bicyclists/pedestrians
- To identify desirable locations for bicycle facilities
- To establish a method for prioritizing sidewalk construction projects along existing streets
- To establish design guidelines for bicycle and pedestrian facilities
- To develop budget cost estimates and identify funding sources
- To develop an implementation strategy for expanding Franklin's bicycle and pedestrian facilities
- To ensure that Franklin's practices, programs, and projects address the needs of bicyclists and pedestrians

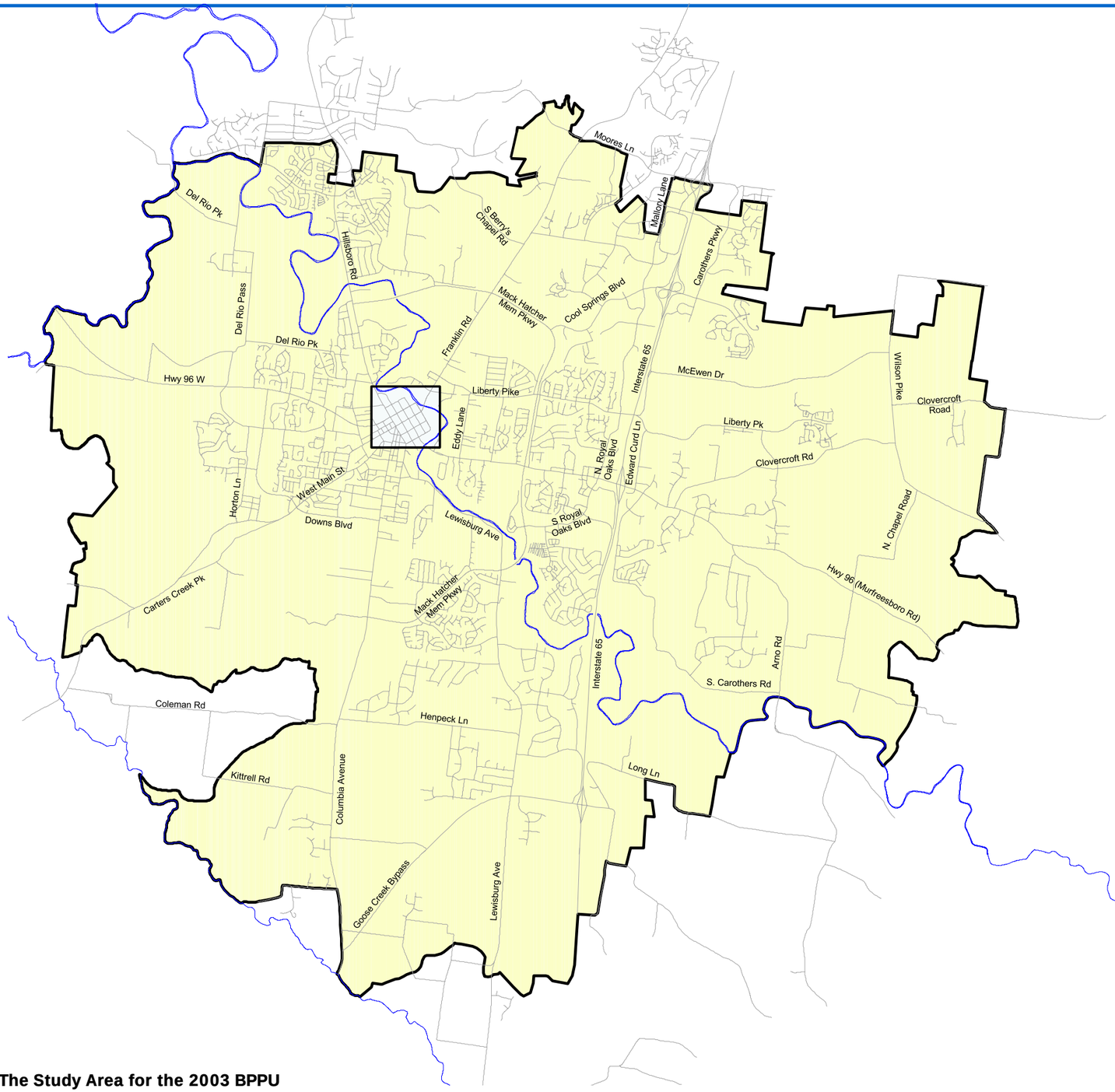
PLANNING PROCESS

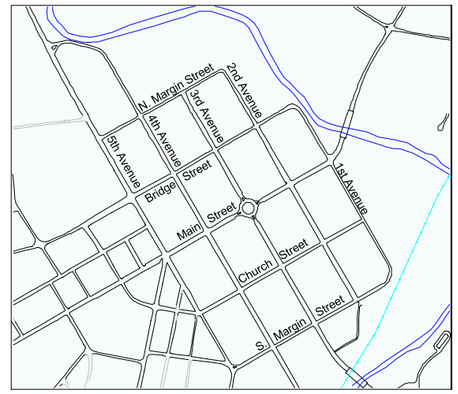
The development of the *2003 BPPU* occurred over a 22-month period between August, 2001 and May, 2003. The planning process was divided into five main tasks. These tasks were:

- Evaluation of existing bicycle and pedestrian conditions
- Assessment of bicyclist and pedestrian needs
- Development of the proposed bicycle and pedestrian network
- Development of design guidelines for bicycle and pedestrian facilities
- Documentation

The study area for this plan is identified in Figure 1.1. As indicated, the study area consists of Franklin's Urban Growth Boundary (UGB).

In order to evaluate the existing bicycle and pedestrian conditions, the locations of the existing bicycle and pedestrian facilities were identified. These facilities were then evaluated to determine where missing links in the system are located. Existing policies, practices, and programs that affect bicyclists and pedestrians were also evaluated.





Legend

Urban Growth Boundary

Figure 1.1 The Study Area for the 2003 BPPU

The needs of bicyclists and pedestrians were then assessed. This assessment included locating the land uses that are likely to attract or generate trips by bicycling or walking. Some of the land uses identified include schools, major shopping centers, major employers, and recreational facilities. Areas that have a high concentration of these pedestrian and cyclist attractors and generators are likely to have a strong need for bikeways and sidewalks.

As part of the development of the proposed bicycle network, an inventory of roadways inside the study area was conducted to determine how compatible the roadways are for bicycle travel. Based on the inventory results and on other factors, such as routes that are currently popular among bicyclists and the desire to provide a connective bicycle network, the recommended locations and types of future bicycle facilities were identified throughout the study area.

As part of the development of the proposed pedestrian network, a method that can be utilized by the City of Franklin to prioritize the construction of sidewalks along existing roadways was developed. This method consists of several need-base factors that, when added together, determine the priority for a sidewalk at a specific location.

As part of the development phase of this plan, the results of the preliminary evaluations, along with the preliminary recommendations for the proposed bicycle and pedestrian network, were presented to the Public Transportation Committee for review and comment.

In addition to the recommended facilities, policies, practices, and programs that will benefit bicyclists and pedestrians were identified. Cost estimates were also prepared for the recommended facilities, and possible funding sources were identified.

The results of the preliminary evaluations and the preliminary recommendations for the proposed bicycle and pedestrian network were presented to the Public Transportation Committee during November, 2002. Based on comments received during this meeting, draft recommendations were developed and documented. The draft version of the *2003 BPPU* was submitted to Franklin for review and comment During May, 2003. Based on the comments received, the final *2003 BPPU* was prepared and submitted to Franklin during June, 2003.

CHAPTER TWO: THE PLANNING CONTEXT

A. BENEFITS OF BICYCLING & WALKING

INTRODUCTION

In recent years, Franklin has made a significant investment in expanding its bicycle and pedestrian infrastructure. To date, Franklin has 19.9 miles of bikeways and plans to construct 3.9 miles within the next few years. Franklin also has sidewalks in many of its residential subdivisions and along many of its collector roads. Franklin requires that all new roadways, with a few exceptions, include sidewalks. This progress and future commitment is a result of Franklin's dedication to providing a balanced, multi-modal transportation system.

The City of Franklin is not the only contributor to a bicycle and pedestrian-friendly community. Local developers have also begun to construct developments that facilitate bicycle and pedestrian travel. Recognizing that land use has a significant effect on non-motorized travel, local developers have begun to construct multi-use developments that have destinations within proximity of each other. Fieldstone Farms and Westhaven are two examples of this type of development. Other promising new developments that are compact neighborhoods and are within bicycling distance of downtown Franklin include Franklin Green and McKay's Mill.

Fieldstone Farms, which is located off of Hillsboro Road in Franklin, contains residential, educational, and retail uses.

These new developments and Franklin's commitment to providing bicycle and pedestrian facilities reflect the community's growing recognition of the variety of benefits offered by bicycling and walking. Some of these benefits include more transportation choices, increased mobility, air quality improvements, reduced health care costs, lower personal transportation costs, fewer bicycle and pedestrian-related deaths and injuries, and improved economic development.

MORE TRANSPORTATION CHOICES

The automobile serves as the primary mode of transportation in the City of Franklin, and public transit will play a significant role in the near future. These modes are best suited for long and mid-length trips. In contrast, bicycling and walking are neighborhood-oriented and are best suited for short-distance trips. A balanced transportation system provides for all modes, allowing travelers to choose the most convenient mode for a given trip. For many travelers, bicycling or walking is the preferred mode for a variety of trips. Indeed, a 1995 Rodale Press study found that 40% of Americans would commute by bicycle if safe facilities were available.[1] This result was almost duplicated in *The 2000 Franklin Household Survey*, which found that 32% of Franklin's citizens would travel by bicycle if more bicycle facilities were available in Franklin.[2]

The FHWA's 1995 *National Personal Transportation Survey* determined that 40% of all trips are less than two miles in distance. An average cyclist can cover two miles in ten or fifteen minutes. Most pedestrians can cover the same distance in about 30 minutes.[1] Currently in Franklin, the vast majority of these short trips are made by car. If even half of these trips were made by bicycling or walking, traffic congestion would be reduced significantly. In addition,

[1] www.bicyclinginfo.org/pp/benefits/tranben/index.htm
[2] *The 2000 Franklin Household Survey*, Franklin, Tennessee, March 2001
[3] Profile of Selected Housing Charachteristics, Franklin, Tennessee, U.S. Census Bureau, 2000. http://www.factfinder.census.gov

walking and bicycling require less space per traveler than automobiles. Thus, infrastructure that supports bicycling and walking can usually be provided with less of an impact and at a lower cost than other transportation facilities.

INCREASED MOBILITY

Many people do not have a driver's license or do not have access to a vehicle. In fact, one-third of people living in the United States do not drive.[1] In Franklin, approximately 4% of households do not own a car at all.[3] Young people, senior adults, and those who choose not to, or cannot afford to, own a car have limited options for transportation in Franklin.

There are no sidewalks near Franklin High School on Hillsboro Road. Due to the volume and speed of traffic on Hillsboro Road, and due to the proximity of the school to subdivisions, this would be an ideal location for sidewalks.

AIR QUALITY IMPROVEMENTS

According to the Environmental Protection Agency (EPA), motorized vehicles are responsible for approximately 49% of nitrogen oxide emissions and approximately 78% of carbon monoxide emissions. In cities with heavy traffic congestion, carbon monoxide emissions from motorized vehicles can increase to 95%.[4] Nitrogen oxide creates ground level ozone, which is a primary contributor to respiratory illnesses. These diseases include asthma, chronic bronchitis, and other health problems to which children and senior adults are especially vulnerable. Due to the number of high ozone days, the American Lung Association gave Williamson County an "F" grade in air quality in 2002.[5]

On an average trip, 60% of the pollution created by an automobile is produced during the first few minutes of operation, before the vehicle's pollution control devices can work effectively. Therefore, short-distance trips produce more pollution on a per-mile basis than long-distance trips.[6] If these short-distance trips were made by bicycling or walking, there would be a significant improvement in air quality. In fact, a four-mile trip by bicycle instead of by car keeps about 15 pounds of pollutants out of the air.[6]

REDUCED HEALTH CARE COSTS

For years, organizations such as the American Lung Association and the Centers for Disease Control and Prevention (CDC) have promoted the health benefits of regular physical activity. Just a few minutes of exercise a day can reduce the risk of coronary heart disease, high blood pressure, diabetes, colon cancer, and depression. However, Americans are more sedentary today than ever. Recent studies from the CDC have found that 68% of American adults are not as active as they need to be, while 35% of young people are not vigorously active on a regular basis.[7] The CDC reports in the *Journal of the American Medical Association* that the United States has the highest obesity rate of any industrialized nation.[8] Tennessee's obesity rate of 22.7% (up from 12.1% in 1991) is among the highest in the nation.[9]

[4] U.S. Environmental Protection Agency, www.epa.gov
[5] American Lung Association, *State of the Air: 2002*
[6] http://bicyclinginfo.org/pp/benefits/enviroben/index.htm
[7] National Center for Health Statistics, *Health, United States, 2002*
[8] Centers for Disease Control, *Journal of the American Medical Association*
[9] Centers for Disease Control, http://www.cdc.gov/nccdphp/dnpa/obesity/trend/prev_reg.htm

Regular physical activity can reduce the risk of coronary heart disease, high blood pressure, diabetes, colon cancer, and depression.

Well-designed pedestrian facilities include roadway crossings that are identified with pavement markings and signs, such as this one in Fieldstone Farms.

LOWER PERSONAL TRANSPORTATION COSTS

No other forms of transportation are more economical than bicycling or walking. The League of American Bicyclists has determined that the cost of operating a bicycle for one year is $120.[10] Walking, of course, is free. Providing a good bicycle and pedestrian infrastructure can free some people from the expense of car ownership, or the need for a second or third car.

FEWER DEATHS AND INJURIES

Roadways that include well-designed bicycle and pedestrian facilities can decrease the likelihood of crashes, while increasing the percentage of pedestrian and bicycle travelers. Well-designed bicycle facilities include bicycle lanes and intersections that provide clear guidance to bicyclists on where to position themselves. Well-designed pedestrian facilities include wide sidewalks that are separated from vehicle travel lanes and intersections that have short crossings and highly-visible crosswalks.

The introduction of well-designed bicycle facilities not only increases motorists' visibility of bicyclists, but also encourages proper roadway usage. Studies have concluded that bicycle lanes significantly increase cyclists' obedience to stop signs and reduce wrong-way bicycle riding, which are two operations that account for a significant percentage of bicycle/car crashes. Furthermore, motorists are more likely to see, and less likely to cut off, cyclists when a bike lane is present.[11]

In addition to well-designed pedestrian facilities, the traveling speed of vehicles also plays an important role in minimizing pedestrian deaths and injuries. Studies have concluded that there is a direct relationship between vehicular speed and the severity of pedestrian injuries resulting from a crash. The probability of a pedestrian dying from a crash with a motor vehicle is 3.5% at 15 mph, 37% at 31 mph and 83% at 44 mph.[12] Therefore, reducing speeds on streets can have a direct safety benefit for pedestrians.

In 1994, the U.S. Department of Transportation established a goal of doubling the number of pedestrian and bicycle trips while reducing injuries and fatalities by 10%.[13] The means for achieving this goal have largely been focused on engineering, providing more and better quality bicycling and walking facilities. Between 1990 and 2002, annual federal spending on such facilities increased from $6.6 million to $416 million.[14]

[10] http://bicyclinginfo.org/pp/benefits/econoben/index.htm
[11] Federal Highway Administration, *A Comparative Analysis of Bicycle Lanes Versus Wide Curb Lanes*, December 1999
[12] Rudolph Limpert, *Motor Vehicle Accident Reconstruction and Cause Analysis*, Fourth Edition, Michie Company, Charlottesville, 1994
[13] Federal Highway Administration, *The National Walking & Bicycling Study: Final Report*, U.S. Department of Transportation, 1994, FHWA-PD-94-023.
[14] http://www.bicyclinginfo.org/insight/fact_sheets/index.htm

Reducing injuries and fatalities for walkers, bicyclists and motorists alike involves education, law enforcement, and engineering. Although each of these elements must work in conjunction with the others, it is engineering that determines the physical environment that all roadway users share. It is difficult for education and enforcement to compensate for a poorly designed roadway.

IMPROVED ECONOMIC DEVELOPMENT

Public open spaces, such as bicycle and pedestrian facilities, improve the quality of life and attractiveness of a community and can have a dramatic effect on a community's economic growth. In fact, a study of the impacts of open spaces revealed that small business owners consider the availability of open space, parks, and recreation to be the most important factor in choosing new locations for their businesses.[15] Similarly, CEO's of larger corporations have identified quality of life for employees as being the third-most important factor when considering new business locations.[16]

CONCLUSION

Well-designed bicycle and pedestrian facilities offer many benefits to a community. Some of these benefits are measurable, such as lower health care costs and fewer bicycle/pedestrian-related injuries. However, there are also many benefits that are not as easily measured, such as the ability to enjoy a leisurely bicycle ride on a beautiful day or the freedom from driving for every trip. Providing a well-designed bicycle and pedestrian network in Franklin will contribute to a higher quality of life for everyone in the community.

The availability of open spaces, such as the multi-use trail in Pinkerton Park, is considered to be the most important factor in choosing new locations for small businesses.

The ability for a grandfather and grandson to enjoy a leisurely stroll through downtown Franklin on a sunny day is one of the many benefits offered by a well-designed pedestrian system.

[15] John L. Crompton, Lisa L. Love, and Thomas A. More, "An Empirical Study of the Role of Recreation, Parks, and Open Space in Companies' (Re) Location Decisions," *Journal of Park and Recreation Administration*, 1997

[16] National Park Service, 1995

CHAPTER TWO: THE PLANNING CONTEXT

B. RELATIONSHIP TO OTHER PLANNING DOCUMENTS

INTRODUCTION

In its effort to provide a more bicycle and pedestrian-friendly community, the City of Franklin has addressed bicycle and pedestrian-related issues in several of its planning documents. Each of these documents was reviewed during the development of the *2003 BPPU* to ensure that there are common goals and consistency between the plans. The *2003 BPPU* is intended to be used in conjunction with these other planning documents, which are described below.

SUBDIVISION REGULATIONS

The *Subdivision Regulations*, which was adopted in 1966 and includes amendments through July 20, 2000, contains several regulations that are intended to make the City of Franklin a more bicyclist and pedestrian-friendly community. As an urban design principal, the *Subdivision Regulations* encourages developers to take advantage of the land's visual qualities when designing the layout of streets, lots, and sidewalks. It also includes design requirements for bicycle and pedestrian facilities.

The *Subdivision Regulations* provides standards for incorporating bicycle routes on new major and minor arterial roadways that have four or more lanes. It requires that the outside lanes on these roadways be thirteen feet wide instead of twelve feet wide so that bicyclists and motorists may both be accommodated in the outside lanes. To compensate for this additional width, the inside lanes are required to be eleven feet wide.

The *Subdivision Regulations* also contains several standards that pertain to sidewalk placement and design. It requires that sidewalks be included in all residential and commercial subdivisions, with the exception of the following:

- Subdivisions whose preliminary plats were approved prior to March 6, 1986
- Additions to subdivisions where sidewalks are not constructed in previously recorded sections
- Subdivisions located in the Estate Residential (ER) Zoning District
- Subdivisions that contain no more than two lots
- Subdivisions whose lots front on only one side of the street are only required to have sidewalks on that side of the street

The *Subdivision Regulations* requires that sidewalks be at least five feet wide and constructed of Portland cement concrete. It also requires that sidewalks be constructed in an access easement adjacent to the street right-of-way line. However, it grants the Planning Commission the power to approve an alternate pedestrian walkway system, such as internal walkways, for a given development. For street blocks that are longer than six hundred feet, the *Subdivision Regulations* grants the Planning Commission the power to require a dedicated easement and paved crosswalk in order to provide pedestrian access across the street.

The *Subdivision Regulations* grants the Planning Commission the power to approve alternate pedestrian walkway systems in new subdivisions, such as the trail system in Fieldstone Farms.

FRANKLIN DESIGN STANDARDS

One of the intentions of the *Franklin Design Standards*, which was adopted on April 9, 2002, is to encourage a bicyclist and pedestrian-friendly environment. Although this document focuses more on pedestrians than bicyclists, it does include some standards that affect bicycle facilities. For example, it requires that new greenways include an asphalt trail that is at least eight feet wide. It also requires that new greenways be linked to adjacent greenway sites whenever possible. Greenways serve as recreational and transportation facilities for bicyclists, pedestrians, and other users.

The *Franklin Design Standards require that greenways* include an asphalt trail and be linked to adjacent sites. This picture shows the existing Harpeth River greenway, which is connected to the Williamson County Recreation Center.

The *Franklin Design Standards* includes many regulations that pertain to pedestrian travel. It requires that sidewalks be constructed along both sides of all new streets except for rural roads, alleys, and the undeveloped edge of neighborhood parkways. It also requires that sidewalks connect with adjacent properties and building entries within and between developments wherever possible. In addition, it requires that sidewalks be set back a minimum distance of five feet from the street curbs in all zoning districts except for the urban area and commercial areas that are designed to have similar character. This five-foot wide strip is reserved for street trees, which are required to be planted in accordance with the City's landscaping requirements.

The *Franklin Design Standards* requires that all sidewalks have a minimum width of five feet, with two exceptions. Sidewalks that are adjacent to buildings in commercial areas are required to be at least eight feet wide, and sidewalks that are adjacent to perpendicular parking spaces are required to be at least seven feet wide. Although the *Subdivision Regulations* states that sidewalks are to be constructed of Portland cement concrete, the *Franklin Design Standards* permits the use of materials such as concrete, bricks, and textured pavers.

The *Franklin Design Standards* requires that sidewalks be raised above the adjacent street level. Generally, this means that sidewalks should be constructed at curb height. It also requires that well-defined pedestrian crossings be provided at intersections in commercial areas. The use of textured pavers to accentuate pedestrian crossings is encouraged. This document also permits the use of raised pedestrian crossings at intersections for traffic calming purposes.

The design of residential and commercial developments and their effect on pedestrian activity is also addressed by the *Franklin Design Standards*. Residential developments that have inter-connective streets with short block lengths and commercial developments whose buildings front streets are encouraged. The use of ground-oriented, pedestrian-scale lighting along walkways, as opposed to pole-mounted fixtures, is also encouraged.

The *Franklin Design Standards* encourages the use of pedestrian-scale lighting along walkways, as shown in the foreground of this picture. This design is preferred over the use of pole-mounted fixtures, as show in the background of this picture.

ZONING ORDINANCE

The current *Zoning Ordinance* was adopted on April 9, 2001, and it contains amendments through June 11, 2002. Although this document contains few regulations that directly relate to bicycle and pedestrian facilities, it does address issues that affect one's decision to bicycle or walk. For example, the *Zoning Ordinance* contains landscaping requirements for the various zoning districts. The landscaping requirements are intended to preserve the natural aesthetic character of the community, improve air quality, and reduce heat, glare, and noise. These quality-of-life considerations encourage bicycle and pedestrian activity. The *Zoning Ordinance* also contains regulations that are intended to preserve the historic sites and heritage of the community. These regulations stimulate bicycle and pedestrian activity by promoting business and tourism in the community.

The *Zoning Ordinance* contains regulations regarding the size and construction phasing of common open spaces in new developments. Common open spaces enhance the aesthetic character of the community and provide a place for recreational activities. The *Zoning Ordinance* also contains regulations regarding lighting and visibility at street intersections, which improve the safety of bicyclists and pedestrians.

The landscaping requirements contained in the Zoning Ordinance are intended to improve the quality of life for the community. Street trees and other landscaping materials, such as those shown in this picture, create an attractive sidewalk corridor and encourage pedestrian activity.

Chapter Eight of the *Zoning Ordinance* contains the Access Ordinance. This ordinance regulates the number, location, and dimensions of driveways in Franklin. It also contains provisions for shared-accesses. These regulations help to reduce the number of conflict points between motorists, bicyclists, and pedestrians.

1998 MAJOR THOROUGHFARE/BIKEWAY PLAN UPDATE AND THE 2001 LIMITED WESTERN UPDATE

These planning documents identify short-term and long term transportation system needs and identify improvements to meet those needs. The recommendations contained in these plans include roadway improvements, new roadways, new bicycle facilities, and new sidewalks. These documents also provide recommended roadway cross-sections that include bicycle and pedestrian facilities. The *2003 BPPU*, along with the *2003 Major Thoroughfare Plan Update* (*2003 MTPU*), will serve as a comprehensive update to the 1998 and 2001 plans.

FRANKLIN LONG RANGE PLAN / LAND USE PLAN

These plans identify the current land uses and character of Franklin. They also identify future growth management policies that are intended to improve the community. Franklin is currently in the process of updating these documents.

CAPITAL IMPROVEMENTS PROGRAM GUIDE

This document, which is updated every five years and currently covers fiscal years (FY) 2003—2007, is designed to provide guidance for Franklin's Capital Improvements Program (CIP). It is a five-year planning tool that forecasts capital needs, such as funds for a future road improvement project, and capital needs in relation to revenue/expenditure forecasts. The *2003 BPPU* should be consulted when identifying road improvement projects for the CIP. Recommended bicycle facilities along these roads should be incorporated with the CIP projects.

TRANSPORTATION IMPROVEMENT PROGRAM

The *Transportation Improvement Program* (TIP), which is updated every three years by the Nashville Area Metropolitan Planning Organization (MPO), compiles and prioritizes scheduled transportation projects within the region. All of the listed projects are funded, in part, with federal funds that are allocated as part of the *1996 Transportation Equity Act for the 21st Century (TEA-21).* Bicycle and pedestrian-related projects qualify for funding through several *TEA-21* funding categories. *TIP* criteria for project selection encourage projects that facilitate non-motorized transportation. *TIP* projects must comply with air quality conformity requirements. Because the *TIP* is the sole means of distributing *TEA-21* regional transportation funding, every project identified in the *2003 BPPU* for which federal funds are desired must be included in the *TIP*.

THE CODE OF ORDINANCES

Franklin's *Code of Ordinances* contains several regulations that pertain to sidewalks. With a few exceptions, this document prohibits persons from using or occupying any portion of a public sidewalk to sell, store, or exhibit materials. News racks and vending machines are permitted on sidewalks. However, these items must be placed so that their effects on pedestrian flow and safety are minimized. Similarly, landscape material near sidewalks must be placed in a location that will not endanger pedestrians.

The *Code of Ordinances* prohibits littering on sidewalks and requires property owners to keep adjacent sidewalks clean. It also prohibits property owners from allowing gates or doors to swing open over any sidewalk.

The *Code of Ordinances* does not specifically address bicycle-related issues. However, it does reference bicycle regulations contained in *Tennessee Code Annotated.* These bicycle regulations are described below.

TENNESSEE CODE ANNOTATED

This document grants bicyclists all of the rights and subjects them to all of the duties applicable to motorists. It requires bicyclists to ride upon or astride a fixed seat and does not permit more than the intended number of people on a bicycle at one time. It also prohibits people from attaching their bicycles to other vehicles, except when using specially designed bicycle trailers. In addition, this document does not allow bicyclists to carry any object that prevents them from keeping at least one hand on the handlebars.

The *Tennessee Code Annotated* requires bicyclists traveling at less then the normal speed of traffic to ride as close as practical to the right-hand curb or edge of roadway. This rule does not apply when a bicyclist is passing another vehicle traveling in the same direction, when it is reasonably necessary to avoid objects or other unsafe conditions, and when a bicyclist is preparing for a left turn. The *Tennessee Code Annotated* does not permit bicyclists to ride more

Landscaping materials near sidewalks must be placed in a location that will not endanger pedestrians, as required by the *Code of Ordinances.*

The Tennessee Code Annotated requires bicyclists to ride as close as possible to the edge of roadway when traveling at less than the normal speed of traffic.

than two abreast on roadways and requires bicyclists who are riding two abreast to do so in a single lane.

Franklin's *Code of Ordinances* also contains regulations regarding bicycle lamps and brakes. It sets visibility requirements for front lamps and rear reflectors, which are required for nighttime riding. It also contains braking requirements for all bicycles.

TENNESSEE DEPARTMENT OF TRANSPORTATION (TDOT) BICYCLE AND PEDESTRIAN POLICY

This policy requires that bicycle and pedestrian facilities be included in new construction and reconstruction projects in all urbanized areas unless the following conditions are met:

- Bicyclists and pedestrians are prohibited by law from using the roadway.
- The cost of establishing the facilities would be excessively disproportionate to the need or probable use.
- Sparsity of population or other factors indicate an absence of need.

This policy also requires that, in rural areas, paved shoulders be included in all new construction and reconstruction projects on roadways used by more than 1,000 vehicles per day. The use of rumble strips is discouraged unless there is a minimum clear path of four feet in which bicyclists may travel. Pedestrian facilities are also addressed by TDOT's policy. This policy requires that pedestrian facilities and appurtenances, such as street furniture and transit stops, be designed, constructed, operated, and maintained so that all pedestrians can use the facilities safely and independently, regardless of their physical abilities.

TDOT's policy requires that the design and development of the transportation infrastructure improve conditions for bicycling and walking through the following measures:

- Planning projects for the long term
- Addressing the need for bicyclists and pedestrians to cross-corridors, as well as travel along them
- Getting exceptions approved at a senior level
- Deisgning facilities according to the best currently available standards and guidelines

Finally, TDOT's policy recommends the following:

- Include bicycle and pedestrian facilities in all Advance Planning Reports, Deficiency Analyses, and design, construction, and right-of-way plans and documentation.
- Include bicycle and pedestrian facilities into the TRIMS database.
- Incorporate new bicycle and pedestrian facilities that have been adopted by other State of Tennessee and local planning agencies.

THE 2000 FRANKLIN HOUSEHOLD SURVEY

This survey provides an indication of the attitudes and opinions of residents regarding issues that affect the quality of life in Franklin. Some of the topics addressed by the survey include transportation issues, city services, and development issues.

Although almost all of the survey respondents indicated that they are satisfied with the quality of life in Franklin, the results indicate that there is strong support for more bikeways and sidewalks in Franklin. In fact, 32% of the respondents stated that they would bicycle for transportation if more bicycle facilities were available. Likewise, 16% of the respondents stated that they would like to see more sidewalks in Franklin. Approximately 16% of the respondents also stated that their neighborhoods appear to be unsafe for pedestrians.

OTHER PLANNING EFFORTS

The Transportation Management Association Group (TMA) is a private, non-profit organization that was founded in 1988. In addition to addressing issues that improve mobility, this group advocates transportation demand management (TDM) strategies that reduce the number of single occupant vehicles. Therefore, it is evident that the TMA is a strong supporter of bicycle and pedestrian facilities.

To increase bicycle safety, the TMA initiated the organization of a Franklin Bicycle Advisory Coalition (BAC). The BAC conducts various efforts to improve bicycle safety, including a Bicycle Safety Rodeo. This rodeo is held each May, which is National Bicycle Month.

The TMA is in the process of developing a Travel Reduction Incentive Ordinance with the City of Franklin. The purpose of this ordinance is to reduce traffic congestion, conserve energy, and reduce air pollution. This ordinance may encourage developers and businesses to provide bicycle and pedestrian-related amenities through the use of incentives. It may also contain requirements for new commercial developments regarding bicycle lockers, lockers, and showers.

The TMA's Bicycle Safety Rodeo includes hands-on activities that are designed to improve children's bicycling skills and teach safe riding practices.

CHAPTER THREE: EXISTING CONDITIONS

A. BICYCLE FACILITIES

INTRODUCTION

Until the mid 1990's, the City of Franklin did not include bicycle facilities as part of its transportation planning efforts. However, a lot has changed since that time. By 1998, when Franklin's first official bicycle plan was produced (*1998 MTPU*), Franklin had constructed approximately 1.3 miles of bikeways. Today there are 19.9 miles of bikeways in Franklin. Although these facilities are spread out over a large area, they do serve a foundation for a city-wide bikeway system. Because the presence of well-designed bicycle facilities influences one's decision to bicycle for transportation, the recommendations contained in the *2003 BPPU* will focus on building a network of well-designed bikeways that will span Franklin's Urban Growth Boundary.

EXISTING BICYCLE FACILITIES

An inventory of the existing and planned bicycle facilities was conducted for the study area. The results of this inventory are listed in Table 3.1 and shown graphically in Figure 3.1. As indicated, the northeastern and northwestern portions of the UGB are connected by the state bicycle route, which also connects to several of Franklin's existing and planned bike lanes. However, Franklin is lacking north-south bicycle access through the UGB, and most of the southern portion of the UGB does not have access to any bicycle facilities. Because the presence of well-designed bicycle facilities strongly influences one's decision to bicycle for transportation, bicycle facilities should connect popular origins and destinations. However, many of the popular destinations in Franklin, such as the Cool Springs area, have few or no bicycle facilities.

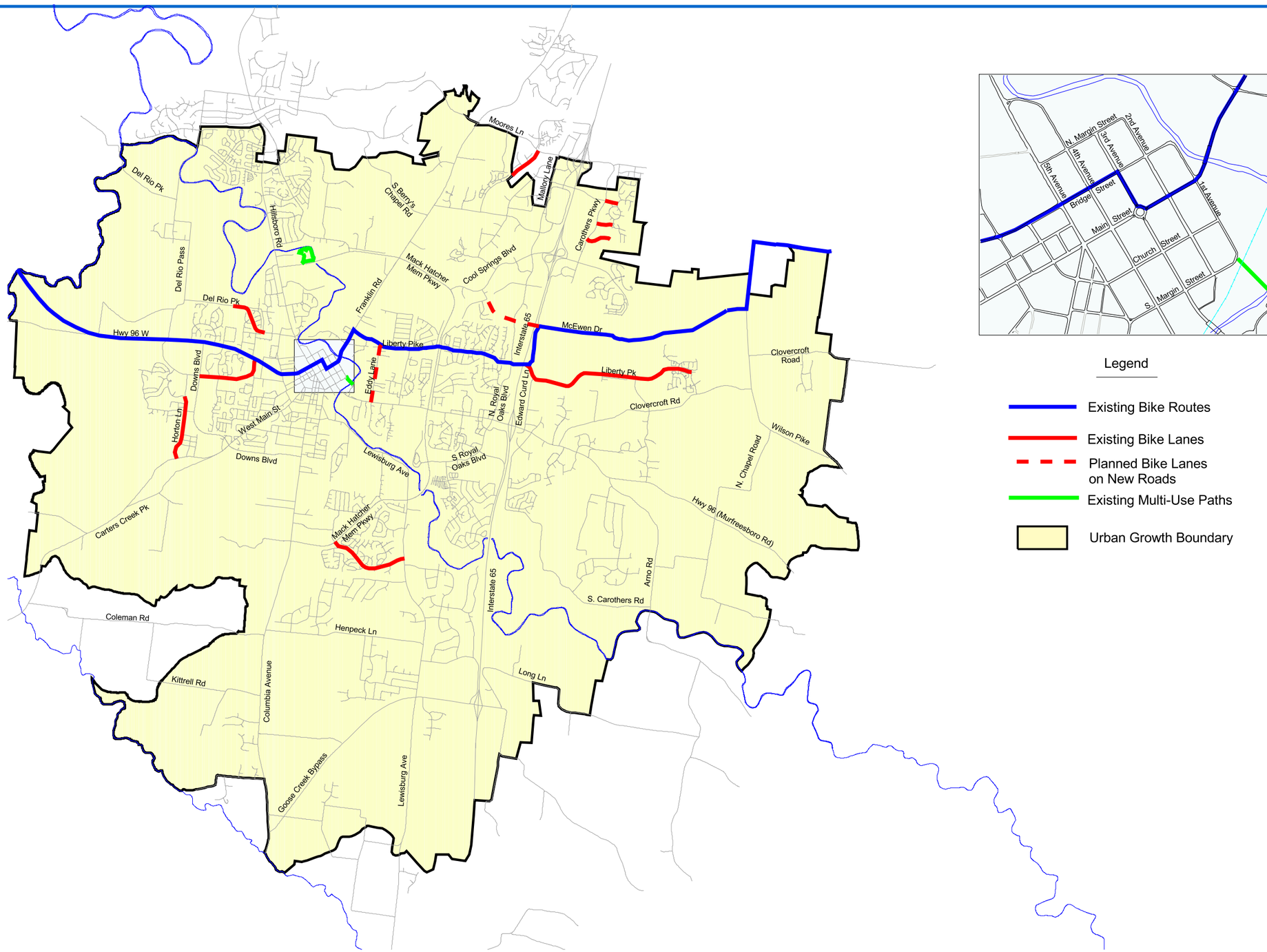
Although the official bikeways in Franklin do not yet form a connective network, there are several unofficial routes in and around Franklin that are popular among bicyclists. Some of these routes include Old Hillsboro Road, Vaughn Road, Old Natchez Trace, Del Rio Pike, Arno Road, and Lewisburg Pike. Typically, these unofficial routes are either relatively low-volume roadways or two-lane roadways with wide shoulders.

Del Rio Pike is an unofficial bike route in Franklin that is popular among bicyclists.

Road	From	To	Facility Type	Length (Mile)
3rd Avenue North**	Bridge Street	Main Street	Existing Bike Route	0.1
Bakers Bridge Avenue	Carothers Parkway	Sliders Knob Avenue	Existing Bike Lanes	0.2
Boyd Mill Avenue (East)	Downs Boulevard	Highway 96	Existing Bike Lanes	0.9
Bridge Street**	5th Avenue	3rd Avenue	Existing Bike Route	0.2
N. Carothers Road	Liberty Pike	Quail Hollow Court	Planned Multi-Use Path	0.6
Del Rio Pike	West Del Rio Pike Split	Poplar Grove Grade School	Existing Bike Lanes	0.6
Donelson Creek Parkway	Mack Hatcher Parkway	Lewisburg Avenue	Existing Bike Lanes	1.1
Franklin Road**	1st Avenue	Liberty Pike	Existing Bike Route	0.5
Eddy Lane	Liberty Pike	Highway 96	Planned Bike Lanes	0.8
General George Patton Drive*	Moores Lane	Northern Boundary	Existing Bike Lanes	0.6
Gillespie Drive	Carothers Parkway	Eastern Terminus	Existing Bike Lanes	0.3
Harpeth River	At the Franklin Recreation Complex	At the Franklin Recreation Complex	Existing Multi-Use Path	0.7
Highway 96 West**	Western Boundary	5th Avenue	Existing Bike Route	4.4
Horton Lane	Carters Creek Pike	Winberry Drive	Existing Bike Lanes	0.9
Liberty Pike**	Franklin Road	Liberty Road	Existing Bike Route	2.4
Liberty Pike	Liberty Road	Eastern Terminus	Existing Bike Lanes	2.5
Liberty Road**	Liberty Pike	McEwen Drive	Existing Bike Route	0.6
Main Street**	3rd Avenue	1st Avenue	Existing Bike Route	0.2
Mayfield Drive	Carothers Parkway	Walters Avenue	Existing Bike Lanes	0.2
McEwen Drive Extension	Cool Springs Boulevard	Liberty Road	Planned Bike Lanes	1.0
McEwen Drive	Liberty Road	Cool Springs Boulevard Extension	Planned Bike Lanes (Existing Bike Route)	1.5
McEwen Drive	Cool Springs Boulevard Extension	Wilson Pike	Existing Bike Route	1.5
Pinkerton Park Bridge	Pinkerton Park	S. Margin Street	Existing Multi-Use Trail	0.1
Split Log Road* **	Wilson Pike	Northern Boundary	Existing Bike Route	1.0
Wilson Pike**	McEwen Drive	Northern Boundary	Existing Bike Route	0.5
Wilson Pike* **	Northern Boundary	Split Log Road	Existing Bike Route	0.4

* This roadway segment is located in Brentwood, Tennessee.
** This roadway segment is part of the old “Natchez Trace To Fall Creek Falls” route that is included in the Tennessee Bicycling Highways maps.

Table 3.1: Inventory of Existing and Planned Bicycle Facilities



Legend

- Existing Bike Routes
- Existing Bike Lanes
- Planned Bike Lanes on New Roads
- Existing Multi-Use Paths
- Urban Growth Boundary

Figure 3.1 Existing Bicycle Facilities Map

CHAPTER THREE: EXISTING CONDITIONS

B. PEDESTRIAN FACILITIES

INTRODUCTION

Sidewalks are a vital component of an effective pedestrian network. When properly designed and maintained, sidewalks increase pedestrian mobility, safety, and accessibility. Properly designed sidewalks are particularly desirable for persons with disabilities, children, and older adults.

Sidewalks should connect popular destinations and should provide direct, continuous routes. They should also be free of obstructions. Other good design characteristics include adequate width and a buffer that separates pedestrians from vehicular traffic or on-street parking. Sidewalks should be designed to enhance the look and feel of the pedestrian environment. This includes landscaping and open spaces, such as plazas, courtyards, and building facades, that give shape and character to the adjacent street. Amenities such as street furniture, art, plantings and historical references will also promote a sense of place. These design characteristics help to encourage walking and promote higher levels of pedestrian travel.

EXISTING PEDESTRIAN FACILITIES

A review of existing pedestrian facilities was conducted for the study area. This review indicated that sidewalks are provided in many of the larger commercial areas. These areas include historic downtown Franklin and portions of the Cool Springs area. The sidewalk systems that are provided in these areas also include crossing facilities, such as marked crosswalks and pedestrian signals, at many intersections.

The sidewalks that are located in historic downtown Franklin are typically older and extend from storefront to street. They include features that tend to encourage pedestrian travel, such as benches, pedestrian-scale lighting, pedestrian-oriented signs, landscaped planters, and sidewalk cafes. These features help to attract the business people, shoppers, and tourists that visit historic downtown Franklin on a daily basis.

The pedestrian-scale lighting, pedestrian-oriented signs, landscaped planters, and sidewalk cafes located in downtown Franklin create an atmosphere that encourages pedestrian travel.

The sidewalks that are located in the Cool Springs Area are typically newer and are usually separated from vehicular traffic by a grass buffer strip. Many of the major intersections that are connected by sidewalks include crossing facilities, such as marked crosswalks and pedestrian signals. Although the sidewalks in this area connect popular destinations, they tend to be separated from the commercial developments by large parking lots. This practice contributes to the low pedestrian volumes in the Cool Springs area.

Large parking lots that separate sidewalks along roadways from businesses can discourage pedestrian travel.

The review of existing pedestrian facilities also indicated that sidewalks are provided in many residential subdivisions, particularly in the newer subdivisions. These sidewalks are typically separated from vehicular traffic by a grass buffer strip. However, marked pedestrian crossings are not usually provided.

Recent residential planning efforts in the Franklin include extensive pedestrian systems. A prime example of this type of development is the Fieldstone Farms subdivision on Hillsboro Road. This subdivision includes sidewalks that connect the various sections and land uses in Fieldstone Farms. Pathways are also provided to connect the collector and arterial roadways that do not have sidewalks to the residential areas in this development.

Throughout the study area, pedestrian facilities are included as an important design feature in new developments. In fact, the *Subdivision Regulations* for Franklin stipulates that sidewalks are required in most new commercial developments and in all new residential developments. This document, along with the *Franklin Design Standards*, also includes guidelines for the width and placement of sidewalks within Franklin.

CHAPTER FOUR: ANALYSES

A. ATTRACTORS & GENERATORS

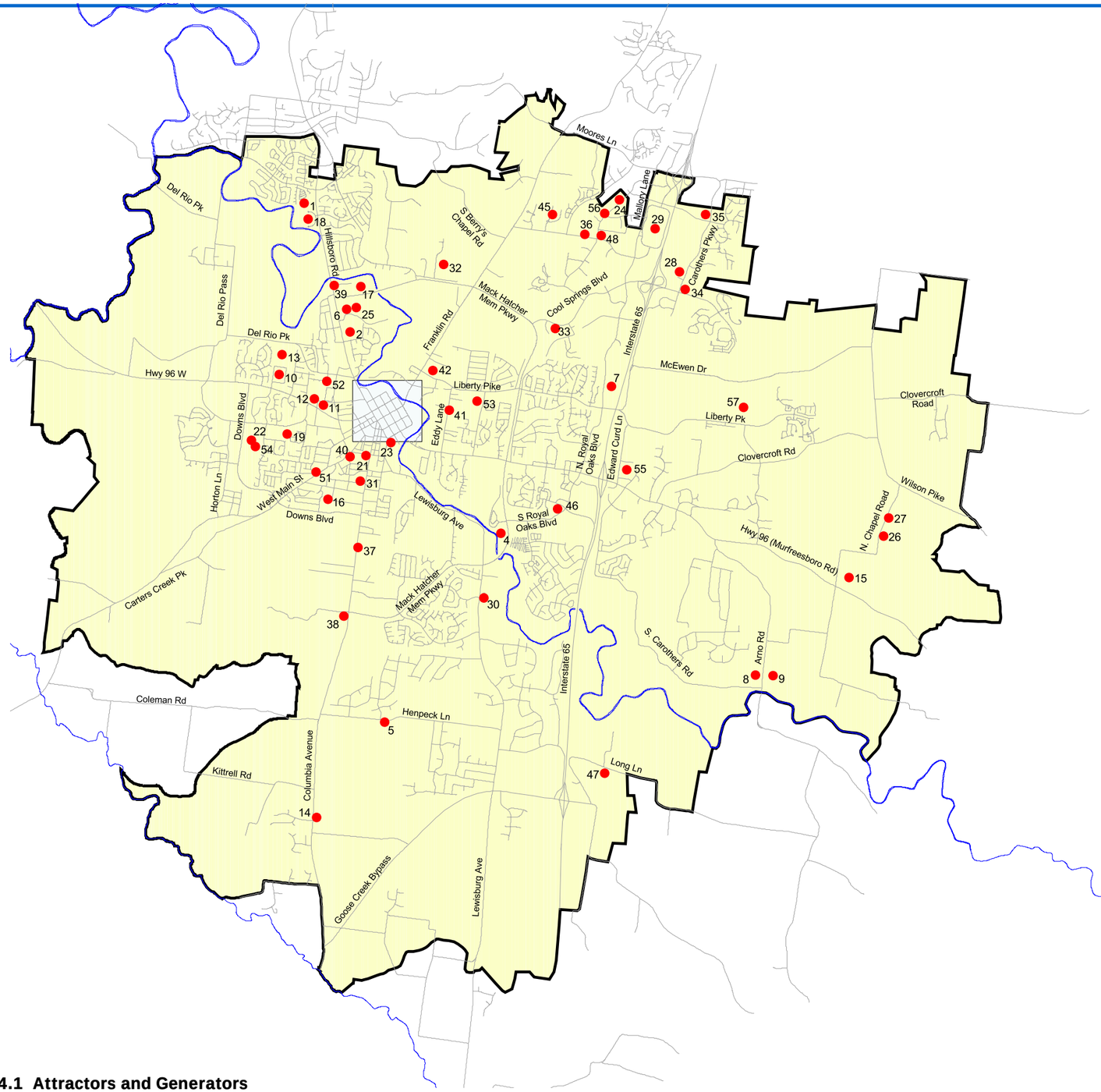
INTRODUCTION

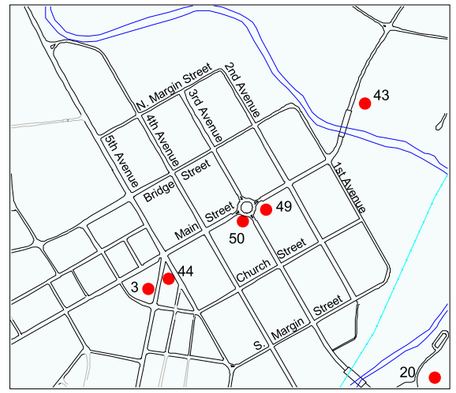
As previously stated, an important component of bicycle and pedestrian networks is connectivity between popular origins and destinations. Simply stated, bikeways and sidewalks should connect places where people are to places where people want to go. Therefore, it is important to identify these locations when planning future bicycle and pedestrian facilities.

ATTRACTORS AND GENERATORS

The facilities in the study area that have a high potential to attract or generate trips by bicycling or walking were identified. These facilities include schools, parks and greenways, libraries and civic centers, large commercial businesses, and retirement communities. Figure 4.1 shows the locations of these facilities. As indicated, many are concentrated along Hillsboro Road, West Main Street, Columbia Avenue, and in historic downtown Franklin. The remaining facilities are scattered throughout the study area.

The Williamson County Recreation Center is one of the many facilities that were identified as having a high potential to attract or generate trips by bicycling or walking.





Legend

1. Hunters Bend Elementary School
2. Franklin High School
3. Williamson County Public Library
4. YMCA - Franklin
5. Oak View Elementary School
6. Columbia State Community College
7. Centinnial High School
8. Page High School
9. Page Middle School
10. Freedom Middle School
11. Johnson Elementary School
12. Freedom Intermediate School
13. Poplar Grove Elementary School
14. Winstead Elementary School
15. Trinity Elementary School
16. Franklin Elementary School
17. Wiliamson County Recreation Complex
18. Fieldstone Park
19. Jim Warren Park
20. Pinkerton Park
21. Williamson County Boys and Girls Club
22. Robert A. Ring Indoor Soccer Arena
23. O'More College of Design
24. Belmont University (Dover Center)
25. Cheek Park
26. Trinity Park / Cecil Lewis Park
27. Judge Jeme Fly Park / FIYE Softball Complex
28. CIGNA Companies
29. Cool Springs Galleria Mall
30. Moore Elementary School
31. Battle Ground Academy Elementary School
32. Battle Ground Academy High School
33. Aim Healthcare Services
34. Marriott - Cool Springs Conference Center
35. Primus
36. Lee Company
37. Plus Mark CPS Corporation
38. Winstead Hill Park
39. Judge Fulton Greer Park
40. Strahl Street Park
41. LDM Technologies
42. The Factory
43. Harpeth Hall Elementary
44. Post Office
45. Morningside Retirement Community
46. Post Office
47. Williamson County Agriculture and Expo Center
48. Williamson County Christian College
49. Franklin City Hall
50. Williamson County Courthouse
51. Williamson County Administrative Complex and Health Center
52. Eagles Nest Academy
53. Liberty Elementary School
54. New Hope Academy
55. Williamson County Medical Center
56. YMCA - Cool Springs
57. Liberty Park

Urban Growth Boundary

Figure 4.1 Attractors and Generators

CHAPTER FOUR: ANALYSES

B. BICYCLE COMPATIBILITY INDEX

INTRODUCTION

The Bicycle Compatibility Index (BCI) is a method that was developed by the Federal Highway Administration (FHWA) for objectively evaluating a roadway's compatibility for bicycle travel. The BCI determines the overall comfort level rating of a bicyclist traveling on a given roadway segment using eight variables, or characteristics, and adjustment factors. The characteristics used by the BCI include:

- Presence of bike lanes or paved shoulders
- Width of bike lane and shoulders
- Width of curb lane
- Volume of traffic in curb lane and volume of traffic in other lanes (same direction)
- Speed of traffic
- Presence of parallel parking
- Character of roadside development (residential or other)

The adjustment factors account for three additional operational factors: truck traffic volume, parking turnover, and right turn volume. The BCI is not formulated to predict bicycle compatibility at intersections. Therefore, for a given roadway segment, the characteristics used to calculate the BCI should represent a non-intersection location.

For the purposes of this project, the BCI was used solely for evaluating existing roadway conditions. The results of the BCI can be used immediately by bicyclists to help them in selecting routes for travel that are within their own comfort range and skill level. Although not included in this plan, the BCI can also be used to predict how certain roadway improvements will affect a roadway's suitability for bicycle travel.

BICYCLE COMPATIBILITY ASSESSMENT

Through the application of standard bikeway network planning principles, roadways throughout the study area were identified as potential corridors for bicycle travel. Each roadway was divided into segments that have uniform characteristics. Data needed to calculate the BCI were collected for each segment and inserted into the BCI formula. The resulting score for each segment represents how compatible that segment is for bicycle travel. The segments were then grouped into the following categories:

- Most Suitable
- More Suitable
- Suitable
- Less Suitable
- Least Suitable

Figure 4.2 illustrates the results of the BCI assessment for the study area. The results of the individual roadway segments are presented in Table 4.1.

A total of 134.1 miles of roadway were evaluated using the BCI. Of this mileage, 0.3% rated Most Suitable, 12.2% rated More Suitable, 37.5% rated Suitable, 46.1% rated Less Suitable, and 3.9% rated Least Suitable.

Many of the roadways that received poor suitability ratings can be enhanced to significantly improve their BCI scores. These improvements may include narrowing conventional travel lanes, shoulder paving, or other improvements. The feasibility of these improvements was considered when identifying the recommended bicycle facilities, which are presented in Chapter Five.

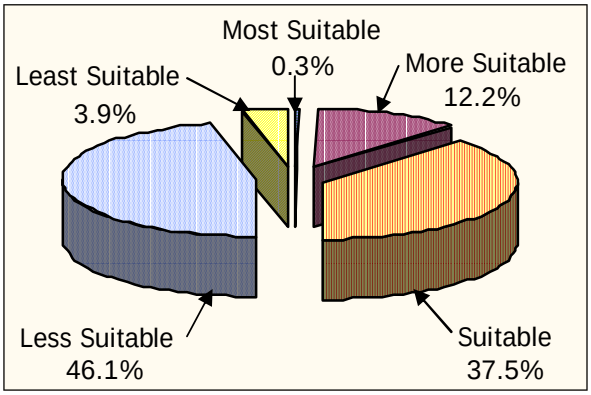
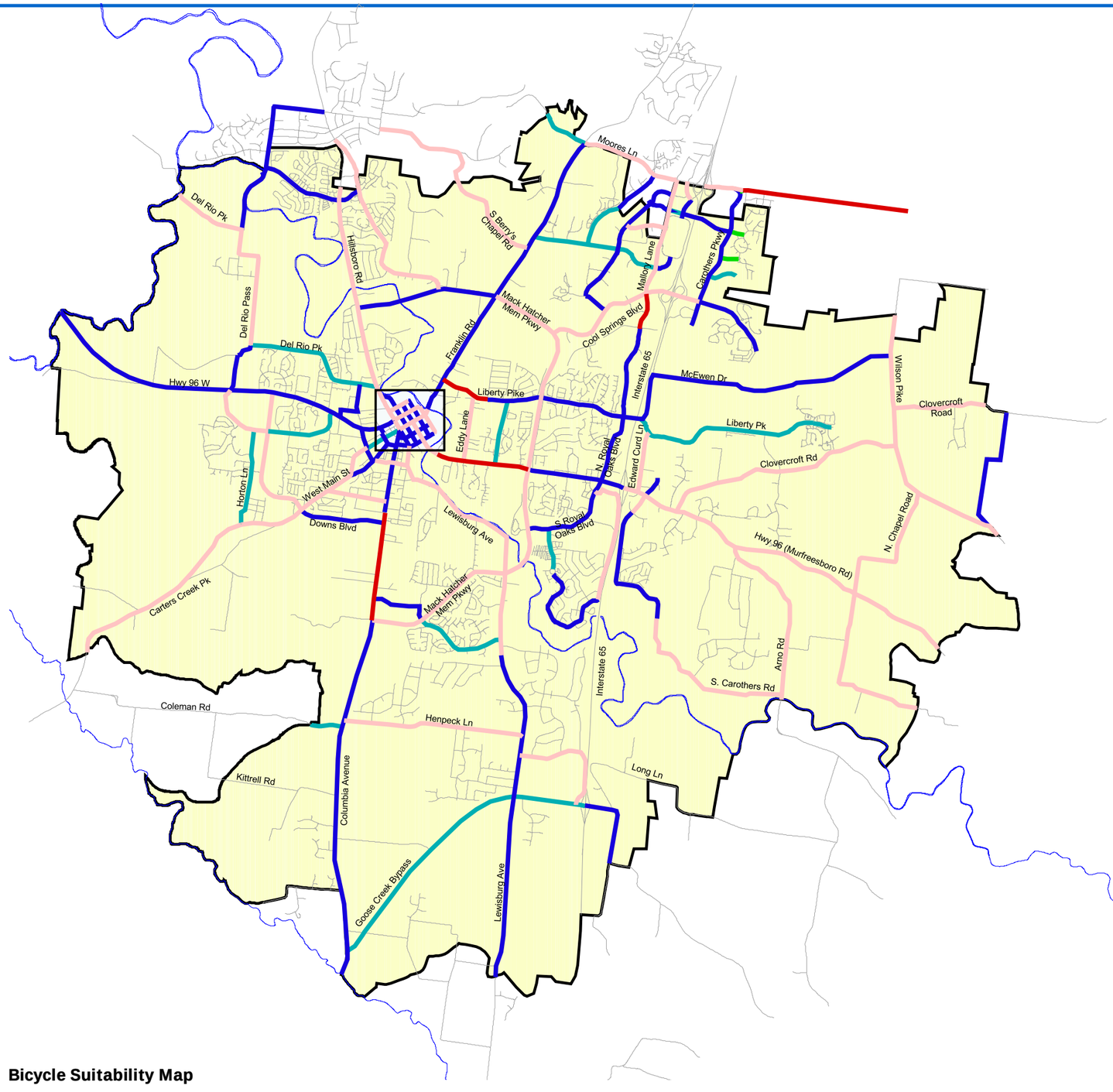
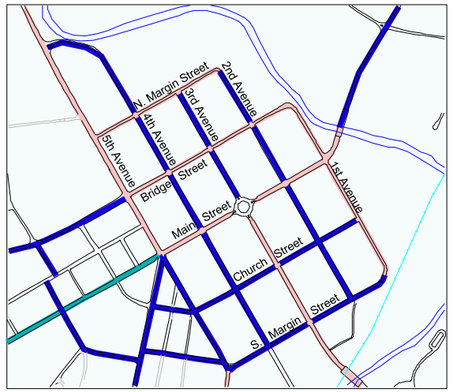


Figure 4.2. Results of the BCI Assessment





Legend

- Most Suitable
- More Suitable
- Suitable
- Less Suitable
- Least Suitable
- Urban Growth Boundary

Figure 4.2 Bicycle Suitability Map

Road Name	From	To	Suitability	Length (Mile)
1st Avenue	Bridge Street	S. Margin Street	Less Suitable	0.4
2nd Avenue	N. Margin Street	S. Margin Street	Suitable	0.5
3rd Avenue	N. Margin Street	Main Street	Suitable	0.2
3rd Avenue	Main Street	S. Margin Street	Less Suitable	0.2
3rd Avenue/Hwy. 96	S. Margin Street	Pinkerton Park	Less Suitable	0.3
3rd Avenue/Hwy. 96	Pinkerton Park	Mack Hatcher Pkwy.	Least Suitable	1.1
4th Avenue	Hillsboro Road	N. Margin Street	Suitable	0.2
4th Avenue	N. Margin Street	S. Margin Street	Suitable	0.5
5th Avenue, N.	Bridge Street	Main Street	Less Suitable	0.1
5th Avenue, S.	Main Street	S. Margin Street	Suitable	0.2
9th Avenue	Highway 96 W.	Fair Street	Suitable	0.1
9th Avenue	Fair Street	Columbia Avenue	Suitable	0.3
11th Avenue	Highway 96 W.	W. Main Street	Suitable	0.2
11th Avenue	W. Main Street	Natchez Street	Suitable	0.2
Arno Road	Highway 96	Study Boundary	Less Suitable	2.1
Aspen Grove Drive	Seaboard Lane	Cool Springs Blvd.	Suitable	0.3
Bakers Bridge Road	Sliders Knob Avenue	Carothers Parkway	Most Suitable	0.2
Bakers Bridge Road	Carothers Parkway	Galleria Boulevard	Suitable	0.6
Bakers Bridge Road	Galleria Boulevard	Mallory Lane	More Suitable	0.2
Bakers Bridge	Mallory Lane	Western Terminus	Suitable	0.3
Battle Avenue	W. Main Street	Columbia Avenue	Less Suitable	0.7
Berry's Chapel Road*	Cotton Road	Hillsboro Road	Suitable	0.6
S. Berry's Chapel Road*	Farmington Drive	Franklin Road	Less Suitable	2.6
Boyd Mill Avenue (East)	Highway 96 W.	Downs Boulevard	More Suitable	0.8
Boyd Mill Avenue (West)	Downs Boulevard	Highway 96 W.	Less Suitable	0.9
Bridge Street	Hillsboro Road	1st Avenue	Less Suitable	0.3
Carlisle Lane	Del Rio Pike	Highway 96 W.	Suitable	0.6
Carothers Parkway	Moores Lane	Cool Springs Blvd.	Suitable	1.5
Carothers Parkway	Cool Springs Blvd.	Southern Terminus	Suitable	0.3
N. Carothers Road	Northern Terminus	Highway 96	Suitable	0.3
S. Carothers Road	Highway 96	Franklin Commons	Less Suitable	0.3
S. Carothers Road	Franklin Commons	Existing Bridge	Suitable	1.6

* This roadway segment is located in Brentwood, Tennessee.

Table 4.1: Bicycle Suitability Results (Pages 4.5 - 4.8)

Road Name	From	To	Suitability	Length (Mile)
S. Carothers Road	Existing Bridge	Arno Road	Less Suitable	2.1
Carters Creek Pike	Horton Lane	Southern Boundary	Less Suitable	2.5
Church Street	1st Avenue	5th Avenue	Suitable	0.3
Church Street	5th Avenue	Columbia Avenue	Suitable	0.1
Clovercroft Road	Highway 96	Wilson Pike	Less Suitable	2.9
Clovercroft Road	Wilson Pike	Eastern Boundary	Less Suitable	1.1
Coleman Road	Columbia Pike	Western Boundary	More Suitable	0.4
Columbia Avenue	Southern Boundary	Mack Hatcher Pkwy.	Suitable	4.3
Columbia Avenue	Mack Hatcher Pkwy.	Fairground Street	Least Suitable	1.3
Columbia Avenue	Fairground Street	Five Points	Suitable	1.0
Cool Springs Boulevard	Mack Hatcher Pkwy.	Carothers Parkway	Less Suitable	2.0
Cool Springs Boulevard	Carothers Parkway	Eastern Terminus	Suitable	0.7
Cotton Road	Del Rio Pike	Berry's Chapel Road	Suitable	1.6
Crossroads Boulevard	Seaboard Lane	Galleria Boulevard	Less Suitable	0.5
Del Rio Pass	Carlisle Lane	Brinkley Drive	Less Suitable	1.3
Del Rio Pike	Brinkley Drive	Western Boundary	Less Suitable	1.2
Del Rio Pike	Carlisle Lane	Hillsboro Road	More Suitable	1.7
Donelson Creek Pkwy	Mack Hatcher Pkwy	Lewisburg Pike	More Suitable	1.1
Downs Boulevard	Columbia Avenue	W. Main Street	Suitable	1.0
Downs Boulevard	W. Main Street	Highway 96 W.	Less Suitable	1.7
Eddy Lane	Liberty Pike	Highway 96	Less Suitable	0.8
Edward Curd Lane	Highway 96	Liberty Pike	Less Suitable	0.7
Fieldstone Parkway	Cotton Road	Lexington Pkwy	Suitable	0.4
Fieldstone Parkway	Lexington Pkwy	Hillsboro Road	Suitable	0.5
Fieldstone Parkway	Hillsboro Road	Spencer Creek Road	Suitable	0.3
Forrest Crossing	S. Royal Oaks Blvd.	Forrest Crossing Cir.	More Suitable	0.5
Fowlkes Street	Natchez Street	Lewisburg Avenue	Less Suitable	0.4
Franklin Road	Harpeth River	Northern Boundary	Suitable	3.7
Galleria Boulevard	Moores Lane	I-65 Exit	Less Suitable	0.2
Galleria Boulevard	I-65 Exit	Mall Loop	Suitable	0.3
Gen. Geo.Patton Dr.*	Moores Lane	Franklin City Limits	Suitable	0.6
Gen. Geo. Patton Dr.	Franklin City Limits	Mallory Station Rd.	More Suitable	0.6

* This roadway segment is located in Brentwood, Tennessee.

Table 4.1: Bicycle Suitability Results (Pages 4.5 - 4.8)

Road Name	From	To	Suitability	Length (Mile)
Gillespie Drive	Eastern Terminus	Carothers Parkway	More Suitable	0.3
Glass Lane	Mt. Hope Street	Highway 96 W.	Suitable	0.3
Goose Creek Bypass	Columbia Pike	I-65	More Suitable	3.6
Goose Creek Bypass	I-65	Peytonsville Road	Suitable	0.3
Henpeck Lane	Columbia Pike	Lewisburg Pike	Less Suitable	2.1
Highway 96	Mack Hatcher Pkwy.	I-65	Suitable	0.9
Highway 96	I-65	Eastern Boundary	Less Suitable	4.3
Highway 96 W.	Western Boundary	11th Avenue	Suitable	4.0
Highway 96 W.	11th Avenue	5th Avenue	Suitable	0.4
Hillsboro Road	Bridge Street	Northern Boundary	Less Suitable	2.9
Horton Lane	Boyd Mill Avenue	Carters Creek Pike	More Suitable	1.2
Lewisburg Avenue	S. Margin Street	Franklin City Limits	Less Suitable	3.1
Lewisburg Avenue	Franklin City Limits	Southern Boundary	Suitable	3.9
Liberty Pike	Franklin Road	Sycamore Drive	Least Suitable	0.6
Liberty Pike	Sycamore Drive	Mallory Lane	Suitable	1.6
Liberty Pike	Mallory Lane	Liberty Road	Suitable	0.2
Liberty Pike	Liberty Road	Traffic Circle	More Suitable	2.3
Liberty Pike	Traffic Circle	Eastern Terminus	More Suitable	0.2
Mack Hatcher Parkway	Hillsboro Road	Franklin Road	Suitable	1.7
Mack Hatcher Parkway	Franklin Road	Columbia Pike	Less Suitable	5.7
Magnolia Street	Del Rio Pike	Mt. Hope Street	Suitable	0.3
W. Main Street	Horton Lane	11th Avenue	Less Suitable	1.9
W. Main Street	11th Avenue	5th Avenue	More Suitable	0.5
Main Street	5th Avenue	Harpeth River	Less Suitable	0.5
Mallory Lane	Moores Lane	Cool Springs Blvd.	Less Suitable	1.4
Mallory Lane	Cool Springs Blvd.	Jordan Road	Least Suitable	0.4
Mallory Lane	Jordan Road	Liberty Pike	Suitable	1.1
Mallory Station Road	Franklin Road	Mallory Lane	More Suitable	1.5
N. Margin Street	5th Avenue	2nd Avenue	Less Suitable	0.3
S. Margin Street	Columbia Avenue	1st Avenue	Suitable	0.5
Mayfield Drive	Carothers Parkway	Walters Avenue	Most Suitable	0.2
McEwen Drive	Liberty Road	Wilson Pike	Suitable	2.9

* This roadway segment is located in Brentwood, Tennessee.

Table 4.1: Bicycle Suitability Results (Pages 4.5 - 4.8)

Road Name	From	To	Suitability	Length (Mile)
Moores Lane Extension	Northern Boundary	Franklin Road	More Suitable	0.6
Moores Lane*	Franklin Road	Mallory Lane	Less Suitable	1.2
Moores Lane*	I-65	Carothers Parkway	Less Suitable	0.5
Moores Lane*	Carothers Parkway	Wilson Pike	Least Suitable	1.9
Natchez Street	W. Main Street	9th Avenue	Suitable	0.6
North Chapel Road	Wilson Pike	Highway 96	Less Suitable	1.7
North Chapel Road	Highway 96	Southern Boundary	Less Suitable	2.1
Peytonsville Road	Lewisburg Avenue	Goose Creek Bypass	Less Suitable	1.4
Peytonsville Road	Goose Creek Bypass	Eastern Boundary	Suitable	0.7
Ralston Lane	Liberty Pike	Highway 96	More Suitable	0.8
Riverside Drive	S. Royal Oaks Blvd.	East of Riverstone Dr.	Less Suitable	1.6
Riverside Drive	East of Riverstone Dr.	Rivergate Drive	Suitable	0.2
Riverview Drive	Rivergate Drive	Forrest Crossing Cir.	Suitable	1.1
N. Royal Oaks Blvd.	Liberty Pike	Highway 96	Suitable	0.8
S. Royal Oaks Blvd.	Highway 96	Mack Hatcher Pkwy.	Suitable	1.2
Seaboard Lane	Mallory Lane	Aspen Grove Drive	Suitable	1.7
Southeast Parkway	Columbia Avenue	Mack Hatcher Pkwy.	Suitable	0.7
South Springs Drive	Mallory Lane	Galleria Boulevard	Suitable	0.3
Spencer Creek Road	Hillsboro Road	Mack Hatcher Pkwy.	Less Suitable	2.5
Tulloss Road	Clovercroft Road	Wilson Pike	Suitable	1.6
Wilson Pike	Northern Boundary	Southern Boundary	Less Suitable	3.3

* This roadway segment is located in Brentwood, Tennessee.

Table 4.1: Bicycle Suitability Results (Pages 4.5 - 4.8)

Mayfield Lane, from Carothers Parkway to its eastern terminus, rated Most Suitable for bicycle travel.

Mallory Lane, from Cool Springs Boulevard to Jordan Road, rated Least Suitable for bicycle travel.

CHAPTER FIVE: RECOMMENDATIONS

A. BICYCLE FACILITIES

INTRODUCTION

Although Franklin currently has only a few bicycle facilities, Franklin does possess many qualities that will facilitate the design and implementation of new bicycle facilities. For example, there are many residential developments that are located within proximity to shopping centers, offices, and retail uses. In fact, the *2000 Franklin Household Survey* found that 61% of Franklin's citizens live near a diverse mix of land uses and that 32% of Franklin's citizens would use bikeways for transportation if bikeways were available.[17] Therefore, it is feasible to convert a high number of motorized trips to bicycling trips in Franklin. Also, Franklin currently has several arterial and collector roads that rank suitable or better on the BCI. These roads are located throughout the county and connect a variety of land uses. It is possible that only minor improvements, such as re-striping, signage, or a little extra pavement width may be required in order to incorporate bicycle facilities on some of these roadways.

The recommendations presented in this plan are intended to enhance the potential for bicycle travel in the study area by identifying specific facilities that should be implemented. These facilities include bicycle lanes, shared roadways, and multi-use trails/greenways. Each of these facility types are briefly described in this chapter.

TYPES OF FACILITIES

BICYCLE LANES

A bicycle lane is a travel lane that is between four and six feet wide and that is designated for exclusive use or preferential use by bicyclists. Bicycle lanes are separated from conventional travel lanes with a lane stripe and are identified by pavement markings and signage. These facilities should be one-way facilities, located on the right side of the street, that carry bicycle traffic in the same direction as the adjacent motor vehicle traffic.

Bicycle lanes are separated from conventional travel lanes with a lane stripe and are identified by pavement markings and signage.

Another type of bicycle lane is a shoulder bikeway. A shoulder bikeway is a paved shoulder that is at least four feet wide and that is separated from motor vehicle traffic by a lane stripe. It is also designated by signage. Unlike a bicycle lane, a shoulder bikeway is not designated exclusively for bicyclists. It may serve as a location to temporarily park a damaged vehicle, or it may serve other functions. Typically, shoulder bikeways are applied to rural roadways that do not have curb and gutter.

Shoulder bikeways, such as Highway 96 West in Franklin, are paved shoulers that are separated from motor vehicle traffic by a lane stripe and are designated by signage.

[17] *The 2000 Franklin Household Survey*, Franklin, Tennessee, March 2001

SHARED ROADWAYS

A shared roadway is a roadway in which motorists and bicyclists share the same travel lanes. There are three types of shared roadways. These are:

- Wide outside lane (WOL)
- Signed shared roadway (SSR)
- Local street

A WOL is a conventional travel lane, located on the right side of the road, that is typically fourteen to fifteen feet wide and that is shared by motorists and bicyclists. The extra width that is provided by a WOL allows motorists to comfortably pass bicyclists without changing lanes and without getting too close to the bicyclists. WOLs are identified by signage and can include pavement markings.

WOLs are conventional travel lanes, located on the right side of the road, that are shared by motorists and bicyclists and are designated by signage.

A SSR is a roadway that is shared by motorists and bicyclists and is identified by signage. Unlike WOLs, SSRs do not provide additional roadway width for bicyclists. However, they should provide features that make them suitable for bicyclists. These features include traffic control devices that are sensitive to bicyclists, bicycle-safe storm grates, and smooth pavement surfaces. They should also be routinely swept in order to prevent debris from accumulating on the roadway. Typically, SSRs are reserved for roads that have a high demand for bicycle traffic but cannot accommodate a bicycle lane or WOL due to physical constraints. SSRs should be considered as temporary bicycle facilities and should be replaced by bicycle lanes or WOLs as soon as this is feasible.

SSRs are roadways that are shared by motorists and bicyclists and are designated by signage.

Local roads are typically low-speed, low-volume roadways. Therefore, they do not usually require special treatment in order to accommodate bicyclists. However, signage may be used to identify a through-bicycle route that follows a local street.

Local roads, such as Rutherford Lane in Franklin, do not usually require special treatment in order to accommodate bicyclists.

MULTI-USE PATHS/GREENWAYS

A multi-use path/greenway is a designated facility that is used for bicycling, walking, running, skating, and other forms of non-motorized travel. It is separated from motorized vehicular traffic by an open space or barrier and

is located within a road right-of-way or an independent right-of-way. Paths/greenways are typically ten feet to twelve feet wide. They are not part of the roadway network, but may travel parallel to certain roadway segments. Also, these facilities may follow the course of natural boundaries, such as rivers and streams, or man-made boundaries, such as railroad lines and utility easements.

Multi-use paths/greenways are designated facilities that are separated from motorized traffic and are used for various forms of non-motorized travel. This multi-use path in Reston, Virginia is located in a utility easement and includes a centerline stripe to separate each direction of travel.

RECOMMENDATIONS

LONG RANGE BICYCLE FACILITIES PLAN

The Long Range Bicycle Facilities Plan (LRBFP) is presented in Figure 5.1. The facilities identified by the LRBFP are also listed in Table 5.1. The map identifies the locations and types of bicycle facilities that are recommended for the study area. It is important to note that this is a long range plan. The LRBFP serves as a vision of the bicycle facility network that should exist in Franklin in approximately twenty to twenty-five years.

The LRBFP was developed in conjunction with the *2003 MTPU* for Franklin. Many of the facilities identified in the LRBFP are located along roadways that have been recommended for improvements in the *2003 MTPU*. These facilities, which are identified in Table 5.1, should be constructed as part of the *2003 MTPU* projects. The remaining facilities should be constructed as individual projects, or as opportunities present themselves. Such opportunities may include roadway repaving projects, new roadway projects, roadway widening projects, streetscape improvement projects, or changes in traffic patterns. One of the purposes of the LRBFP is to ensure that any future opportunity for incorporating bicycle facilities is not lost. Recommended bike routes and WOLs, as identified in the LRBFP, should be upgraded to bike lanes whenever possible.

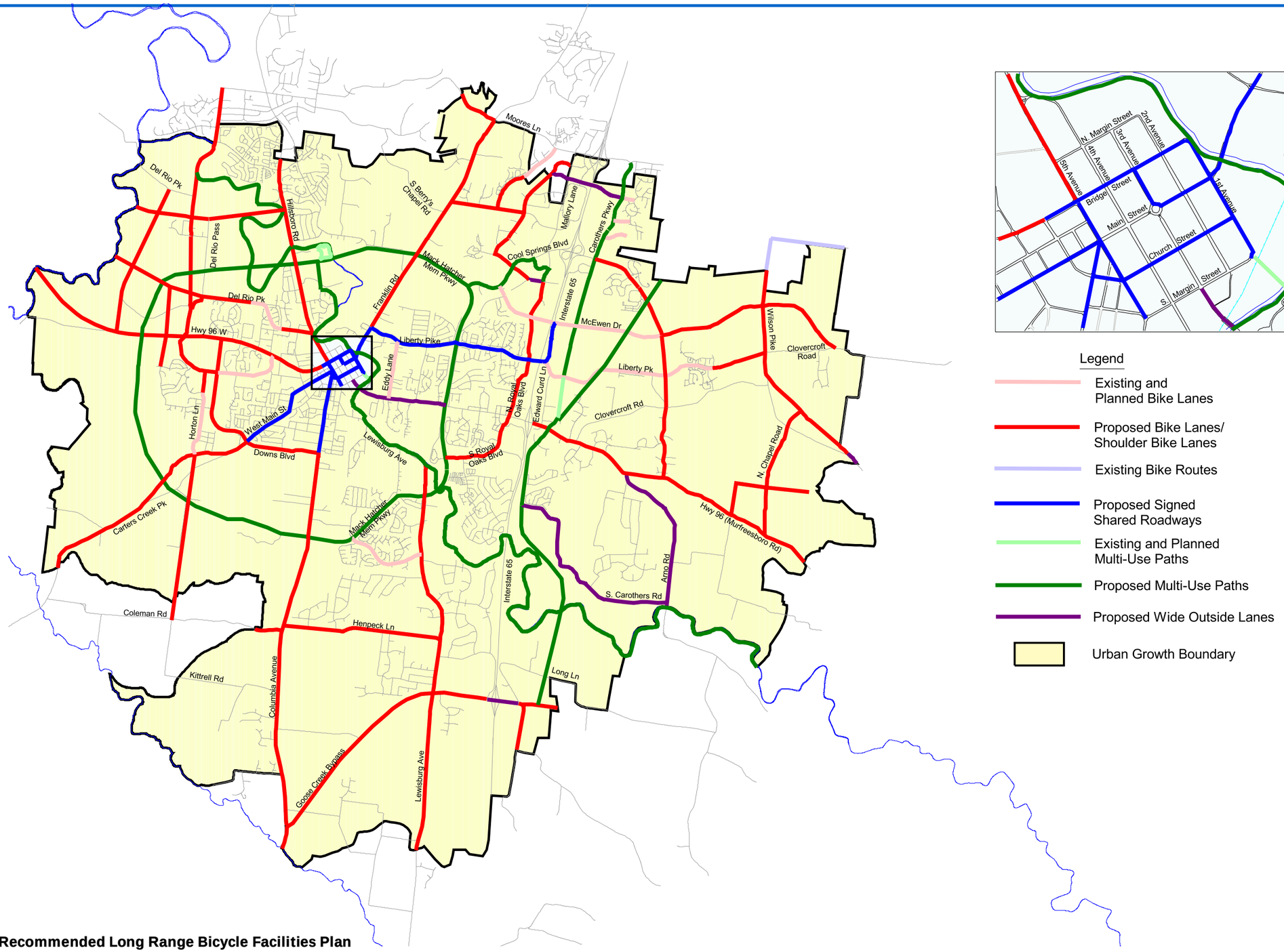
LONG RANGE BICYCLE FACILITIES PLAN — PHASE ONE RECOMMENDATIONS

The LRBFP includes an extensive network of recommended bicycle facilities. Due to the magnitude of this plan, it is anticipated that implementation of the recommended facilities will occur through numerous construction phases and over a long period of time. Figure 5.2 identifies the facilities that are recommended to be constructed as part of Phase I of the LRBFP. These facilities are currently popular among bicyclists and/or form an important connection within the study area. Implementation of these facilities will provide a strong base for the future bikeway network and will facilitate the implementation of other bicycle facilities.

CROSS-SECTIONS

The recommended cross-sections for bicycle lanes, shared roadways, and multi-use paths are presented in Appendix A. In addition to the recommendations contained in this plan, AASHTO's *Guide for the Development of Bicycle Facilities* and the *Manual on Uniform Traffic Control Devices* (MUTCD) should be consulted in order to determine appropriate cross-sections, pavement markings, signage, etc. for new bicycle facilities.

As shown in the cross-sections, bicycle lanes should be at least four feet wide, with a preferred width of six feet. On roadways that have curb and gutter but do not have on-street parking, this width should be accommodated between the outermost lane and the gutter pan.



Legend

- Existing and Planned Bike Lanes
- Proposed Bike Lanes/ Shoulder Bike Lanes
- Existing Bike Routes
- Proposed Signed Shared Roadways
- Existing and Planned Multi-Use Paths
- Proposed Multi-Use Paths
- Proposed Wide Outside Lanes
- Urban Growth Boundary

Figure 5.1 Recommended Long Range Bicycle Facilities Plan

Road Name	From	To	Facility Type	Length (Mile)
1st Avenue	Bridge Street	S. Margin Street	Signed Shared Roadway	0.4
3rd Avenue	Bridge Street	Main Street	Signed Shared Roadway	0.1
5th Avenue	Bridge Street	W. Main Street	Signed Shared Roadway	0.1
5th Avenue	W. Main Street	S. Margin Street	Signed Shared Roadway	0.2
7th Avenue	Columbia Pike	5th Avenue	Signed Shared Roadway	0.1
Arno Road***	Highway 96	Study Boundary	Wide Outside Lanes	2.1
Aspen Grove Drive	Seaboard Lane	Jordan Road	Bike Lanes	0.6
Bakers Bridge Avenue	Seaboard Lane	Carothers Parkway	Wide Outside Lanes	1.0
Bakers Bridge Avenue	Carothers Parkway	Sliders Knob	Existing Bike Lanes	0.2
Boyd Mill Avenue (West)***	Highway 96 W.	Downs Boulevard	Bike Lanes	0.6
Boyd Mill Avenue (East)	Downs Boulevard	Highway 96 W.	Existing Bike Lanes	1.2
Bridge Street	5th Avenue	3rd Avenue	Signed Shared Roadway	0.2
Bridge Street	3rd Avenue	1st Avenue	Signed Shared Roadway	0.1
Carlisle Lane	Del Rio Pike	Highway 96 W.	Bike Lanes	0.7
Carothers Parkway***	Moores Lane	Liberty Pike	Multi-Use Path	3.1
Carothers Parkway	Liberty Pike	Quail Hollow Court	Planned Multi-Use Path	0.6
Carothers Parkway	Quail Hollow Court	Highway 96	Multi-Use Path	0.2
S. Carothers Road***	Highway 96	Goose Creek Bypass	Multi-Use Path	4.1
S. Carothers Road***	S. Carothers Road, South of Upland Drive	Arno Road	Wide Outside Lanes	2.8
Carters Creek Pike***	Downs Boulevard	Southern Boundary	Bike Lanes**	3.2
Church Street	1st Avenue	5th Avenue	Signed Shared Roadway	0.3
Coleman Road***	Columbia Avenue	Western Boundary	Bike Lanes	0.4
Columbia Avenue***	Southern Boundary	Downs Boulevard	Bike Lanes**	5.5
Columbia Avenue	Downs Boulevard	5th Avenue S.	Signed Shared Roadway	1.1
Cool Springs Boulevard***	Carothers Parkway	Liberty Pike	Bike Lanes	2.0
Cool Springs Boulevard***	Mack Hatcher Pkwy.	Frazier Road	Multi-Use Path	1.1
Cotton Road/Del Rio Pike***	Berry's Chapel Road	Southern Terminus	Bike Lanes	1.9
Del Rio Pike***	Carlisle Lane	Poplar Grove Grade School	Bike Lanes	0.7
Del Rio Pike	Poplar Grove Grade School	East Del Rio Pike Split	Existing Bike Lanes	0.6
Del Rio Pike***	East Del Rio Pike Split	Hillsboro Road	Bike Lanes	0.4

*This roadway segment is located in Brentwood, Tennessee.
**Shoulder bike lanes should be provided.
***Part or all of this roadway segment is recommended to be improved in the *2003 MTPU*.

Table 5.1: Recommended Bicycle Facilities (Pages 5.5—5.7)

Road Name	From	To	Facility Type	Length (Mile)
Donelson Creek Pkwy.	Mack Hatcher Pkwy	Lewisburg Avenue	Existing Bike Lanes	1.1
Downs Boulevard	Columbia Avenue	Highway 96 W.	Bike Lanes	2.7
Eddy Lane	Liberty Pike	Highway 96	Planned Bike Lanes	0.8
Franklin Road***	Northern Boundary	Liberty Pike	Bike Lanes**	3.5
Franklin Road***	Liberty Pike	1st Avenue	Signed Shared Roadway	0.3
Frazier Road	Cool Springs Blvd.	Mallory Lane	Multi-Use Path	0.3
Gen. Geo. Patton Dr.*	Moores Lane	Northern Boundary	Existing Bike Lanes	0.6
Gen. Geo. Patton Dr.	Northern Boundary	Mallory Station Rd.	Bike Lanes	0.6
Gillespie Drive	Eastern Terminus	Carothers Parkway	Existing Bike Lanes	0.3
Goose Creek Bypass***	Columbia Avenue	Peytonsville Road	Bike Lanes	3.5
Goose Creek Bypass***	Peytonsville Road	Long Lane	Wide Outside Lanes	0.4
Goose Creek Bypass***	Long Lane	Eastern Boundary	Bike Lanes	0.5
Harpeth River	Cotton Road	Mack Hatcher Pkwy.	Multi-Use Path	4.8
Harpeth River	Mack Hatcher Pkwy.	Ploughmans Bend Drive	Multi-Use Path	0.7
Harpeth River	Ploughmans Bend Drive	1st Avenue	Multi-Use Path	1.2
Harpeth River	1st Avenue	Pinkerton Park	Multi-Use Path	0.4
Harpeth River	Pinkerton Park	Eastern Boundary	Multi-Use Path	11.1
Harpeth River	At the Williamson County Recreation Complex	At the Williamson County Recreation Complex	Existing Multi-Use Path	0.7
Henpeck Lane	Columbia Avenue	Lewisburg Avenue	Bike Lanes	2.2
Highway 96	Mack Hatcher Pkwy.	S. Margin Street	Wide Outside Lanes	1.3
Highway 96	I-65	Eastern Boundary	Bike Lanes**	4.4
Highway 96 W.***	Western Boundary	7th Avenue	Bike Lanes**	4.3
Highway 96 W.	7th Avenue	5th Avenue	Signed Shared Roadway	0.1
Hillsboro Road***	Bridge Street	Northern Boundary	Bike Lanes**	2.9
Horton Lane***	Boyd Mill Avenue	Winberry Drive	Bike Lanes	0.3
Horton Lane	Winberry Drive	Carters Creek Pike	Existing Bike Lanes	0.9
Jordan Road	Aspen Grove Drive	Mallory Lane	Wide Outside Lanes	0.2
Lewisburg Avenue***	Harpeth River	Southern Boundary	Bike Lanes**	5.3
Liberty Pike	Franklin Road	Liberty Road	Signed Shared Roadway	2.4
Liberty Pike	Liberty Road	Eastern Terminus	Existing Bike Lanes	2.6
Liberty Pike Extension***	Eastern Terminus	Wilson Pike	Bike Lanes	0.7

*This roadway segment is located in Brentwood, Tennessee.
**Shoulder bike lanes should be provided.
***Part or all of this roadway segment is recommended to be improved in the *2003 MTPU*.

Table 5.1: Recommended Bicycle Facilities (Pages 5.5—5.7)

Road Name	From	To	Facility Type	Length (Mile)
Liberty Road	Liberty Pike	McEwen Drive	Signed Shared Roadway	0.6
Mack Hatcher Pkwy.	Entire Length of Roadway	Entire Length of Roadway	Multi-Use Path	12.5
Main Street	3rd Avenue	1st Avenue	Signed Shared Roadway	0.2
W. Main Street	Downs Boulevard	5th Avenue	Signed Shared Roadway	1.6
Mallory Lane***	Frazier Road	Jordan Road	Multi-Use Path	0.2
Mallory Lane***	Jordan Road	Liberty Pike	Bike Lanes	1.1
Mallory Station Road	Franklin Road	Seaboard Lane	Bike Lanes	1.0
Mayfield Drive	Carothers Parkway	Walters Avenue	Existing Bike Lanes	0.2
McEwen Drive Extension	Cool Springs Blvd.	Liberty Road	Planned Bike Lanes	1.0
McEwen Drive	Liberty Road	Cool Springs Blvd. Ext.	Planned Bike Lanes	1.5
McEwen Drive***	Cool Springs Blvd. Ext.	Wilson Pike	Bike Lanes	1.5
McEwen Drive Ext.***	Wilson Pike	Clovercroft Road	Bike Lanes	1.2
Moores Lane	Franklin Road	Northern Boundary	Bike Lanes	0.6
North Chapel Road***	Relocated Wilson Pike	Highway 96	Bike Lanes	2.1
Oxford Glen Drive***	Liberty Pike	Highway 96	Bike Lanes	1.4
Peytonsville Road***	Goose Creek ByPass	Southern Boundary	Bike Lanes	0.6
N. Royal Oaks Blvd. / S. Royal Oaks Blvd.***	Liberty Pike	Mack Hatcher Pkwy.	Bike Lanes	2.1
Seaboard Lane	Mallory Lane	Aspen Grove Drive	Bike Lanes	1.7
Split Log Road*	Wilson Pike	Northern Boundary	Existing Bike Route	1.0
Wilson Pike*	Split Log Road	Northern Boundary	Existing Bike Route	0.4
TVA Easement	Northern Boundary	Carothers Parkway	Multi-Use Path	2.4
Wilson Pike***	Northern Boundary	McEwen Drive	Bike Lanes**	0.5
Wilson Pike***	McEwen Drive	Southern Boundary	Bike Lanes**	2.6
New Road***	North Chapel Road	Highway 96	Bike Lanes	0.7
New Road***	Carters Creek Pike	Coleman Road	Bike Lanes	2.2
New Road***	Del Rio Pike	Nolen Lane	Bike Lanes	1.1
New Road***	Del Rio Pike	Highway 96 W.	Bike Lanes	2.1
New Road***	Western Boundary	Hillsboro Road	Bike Lanes	2.0
New Road***	North Chapel Road	Charity Drive Extension	Bike Lanes	0.6
New Road***	Del Rio Pike	Carlisle Lane	Bike Lanes	1.1

*This roadway segment is located in Brentwood, Tennessee.
**Shoulder bike lanes should be provided.
***Part or all of this roadway segment is recommended to be improved in the *2003 MTPU*.

Table 5.1: Recommended Bicycle Facilities (Pages 5.5—5.7)

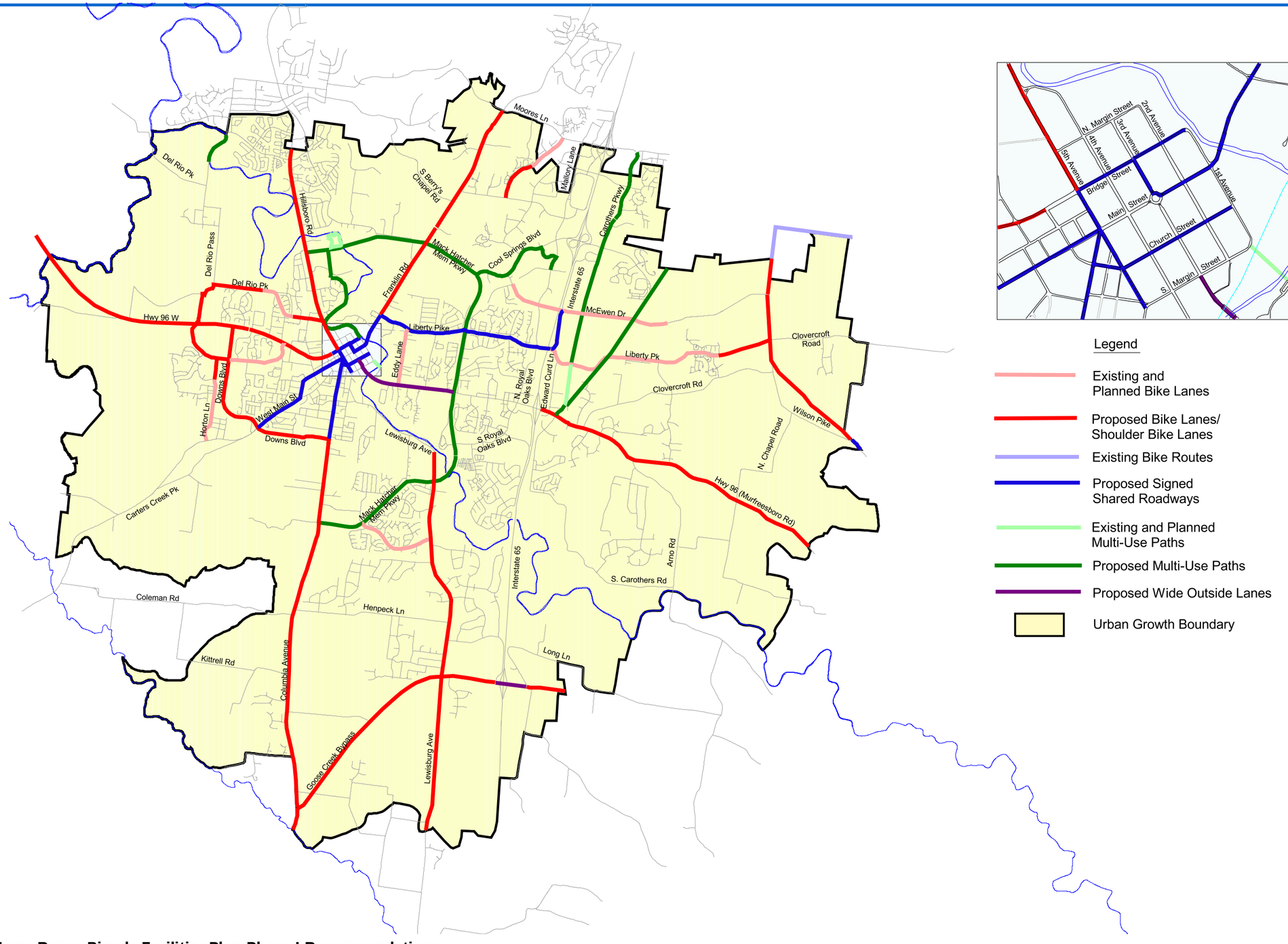


Figure 5.2 Long Range Bicycle Facilities Plan-Phase I Recommendations

On roadways that have on-street parking, a six-foot wide bicycle lane should be located between the parking lane and the outermost travel lane. In constrained areas, this dimension can be reduced to five feet.

An example of a shoulder bicycle lane is also shown in the recommended cross sections. Shoulder bicycle lanes should be at least four feet wide, with a preferred width of six feet. These facilities should be located on the paved shoulder of a roadway.

A WOL, which is also shown in the recommended cross-sections, should be the outermost vehicular travel lane. WOLs should be at least fourteen feet wide. This width does not include the curb and gutter.

The recommended cross-sections contain an example of a signed-shared roadway. As shown, this type of facility is accommodated in a standard, outermost travel lane.

An example of a multi-use path is also presented in the recommended cross-sections. Multi-use paths should be at least twelve feet wide. For multi-use paths that are adjacent to roadways or are heavily used, the width should be wider than twelve feet. A two-foot wide shoulder and clear zone should be provided on each side of a multi-use path.

PAVEMENT MARKINGS

Bicycle facilities should be designated with pavement markings. In addition to the recommendations contained in this plan, AASHTO's *Guide for the Development of Bicycle Facilities* and the *Manual on Uniform Traffic Control Devices* (MUTCD) should be consulted in order to determine appropriate pavement markings for new bicycle facilities.

A bike lane should be separated from motor vehicle travel lanes by a solid white line that is six inches wide. The width of this line can be increased to eight inches for added distinction. If on-street parking is present, a four-inch wide solid white line should be used to separate the bike lane from the parking lane.

Bike lanes should be identified with standard pavement symbols. Figure 5.3 shows the symbols that are typically used to designate bicycle lanes. As shown in the figure, one of the preferred symbols or the words "BIKE LANE" should be used in conjunction with the directional arrow. Figure 5.4 shows the proper placement of these symbols on the far side of an intersection.

A shoulder bike lane should be separated from motor vehicle travel lanes by a solid white line that is six inches wide. Because shoulder bike lanes can be used for other functions, such as a place to park a damaged vehicle, pavement markings should not be used to identify shoulder bike lanes.

WOLs and SSRs should be identified by the shared lane pavement marking. If on-street parking is present, a four-inch wide solid white line should be used to separate the bike lane from the parking lane.

Multi-use paths/greenways do not require pavement markings. However, it is recommended that a solid centerline paint stripe be provided on these facilities in order to separate the different directions of travel.

The shared lane pavement marking should be used to identify WOLs and SSRs.

SIGNAGE

Bicycle facilities should be designated with signage. In addition to the recommendations contained in this plan, AASHTO's *Guide for the Development of Bicycle Facilities* and the *Manual on Uniform Traffic Control Devices* (MUTCD) should be consulted in order to determine appropriate signage for new bicycle facilities.

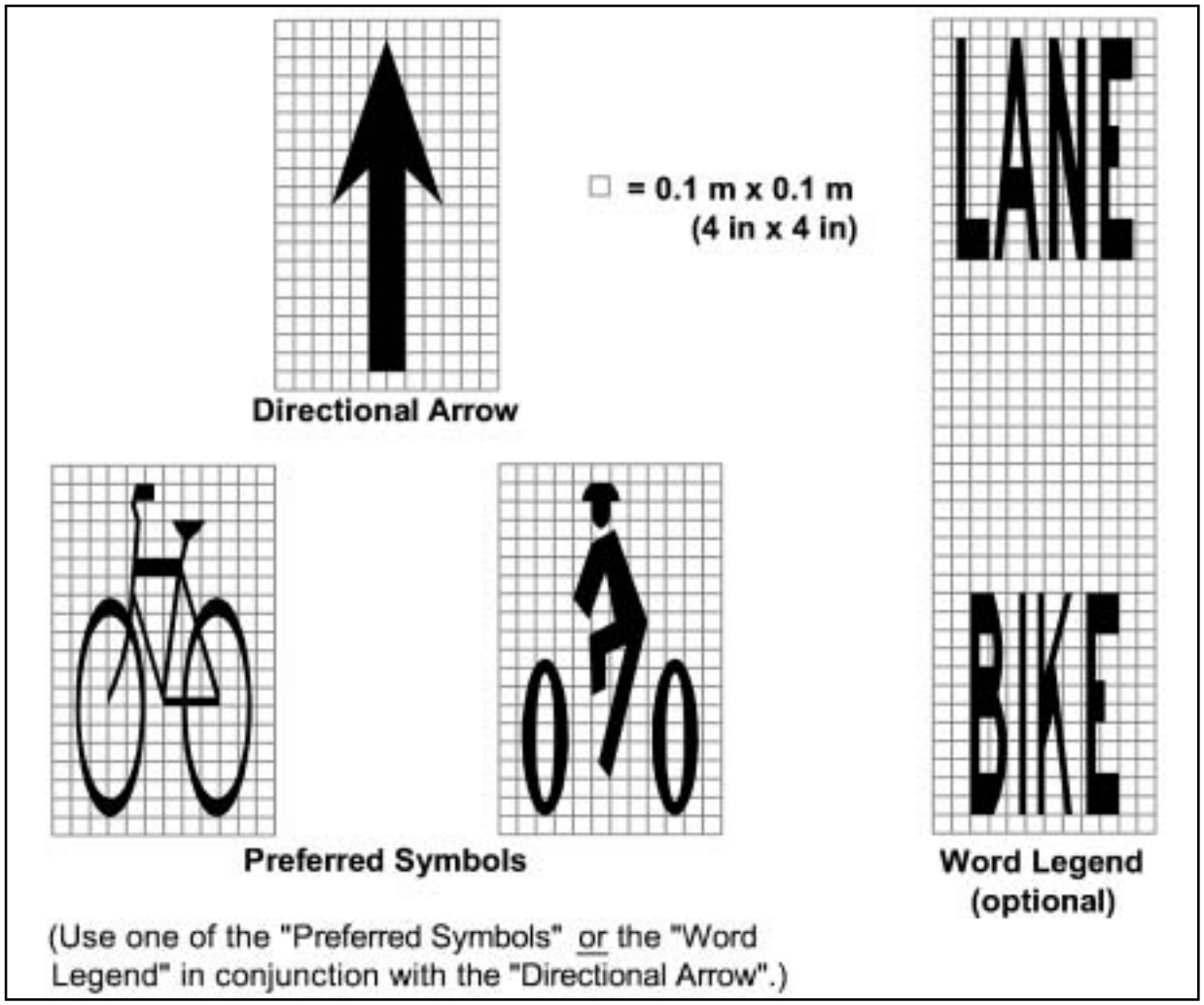


Figure 5.3. Typical Bike Lane Symbols

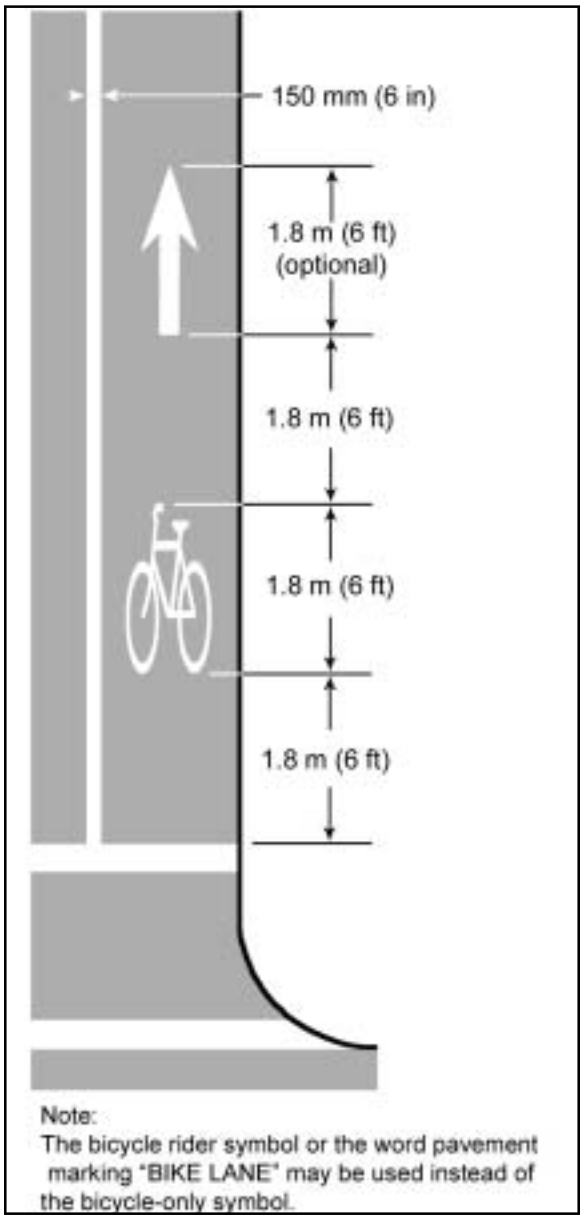


Figure 5.4. This figure shows the proper placement of bike lane symbols on the far side of an intersection.

Signs should be used in moderation in order to avoid distracting roadway users. When signs are used, they should be highly visible and easily understood by all roadway users. Signs that are directed at bicyclists are smaller versions of standard roadway signs. This is because bicyclists typically travel at slower speeds than motorists and are typically closer to the signs than motorists are. Standard roadway signs that are directed at motorists also apply to bicyclists.

As previously stated, the MUTCD provides guidance on bikeway signage and placement of bikeway signage. Figure 5.5 shows the bikeway signage included in the MUTCD.

Bike lane signs (R3-16 and R3-17) are to be used only when bike lanes are marked with the bicycle lane symbol pavement markings. The "Bicycle Lane Ahead" sign (R3-16) and the "Bicycle Lane Ends" sign (R3-16a) are to be used in advance of the beginning of a marked bike lane and when a marked bike lane ends. The "Share the Road" sign (W11-1/W16-1) should be used in conjunction with the "Bicycle Lane Ends" sign. Installation of the "Right Lane Only" sign (R3-17) is recommended at periodic intervals along the bike lane.

Bicycle route signs (D11-1, M1-8, M1-9, and all supplemental plaques) should always include accompanying directional or bikeway identification information. Where bike lanes are present, such signs are only needed at major intersections and where the route changes streets.

Where bike lane segments are discontinuous, bike route signs should include information that directs bicyclists from one bike lane segment to another. Bike route signs should also direct bicyclists to popular destinations.

In areas where motorists chronically park in bike lanes, the "No Parking" signs (R7-9 and R7-9a) should be used. However, bike lane pavement markings typically solve this problem without the need for signs.

When motorists must weave across bicycle traffic to enter a right turn lane, a "Begin Right Turn Lane/Yield to Bikes" sign (R4-4) should be used. This sign should be placed at the beginning of the taper or at the point of the beginning of the weave.

On shared roadways, bicycle route signs (D11-1, M1-8, M1-0, and all supplemental directional plaques) should always include accompanying directional or bikeway identification information. Route signs should be provided at major intersections, where routes change streets, and at intervals not greater than one thousand feet.

Figure 5.5. Bicycle Facilities Signage (Pages 5.12—5.15)
(Manual on Uniform Traffic Control Devices, June 2001)

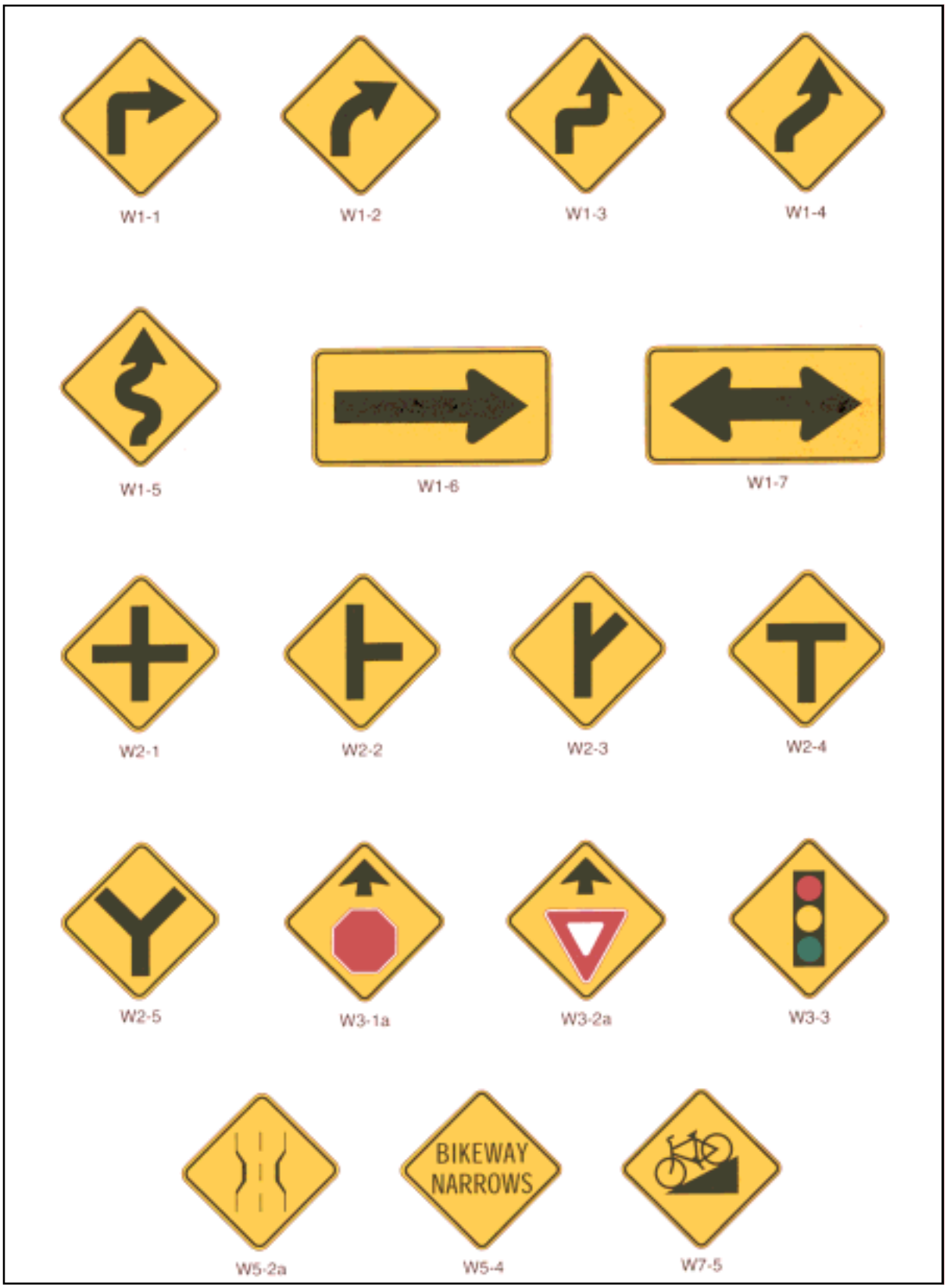


Figure 5.5. Bicycle Facilities Signage (Pages 5.12—5.15)
(Manual on Uniform Traffic Control Devices, June 2001)

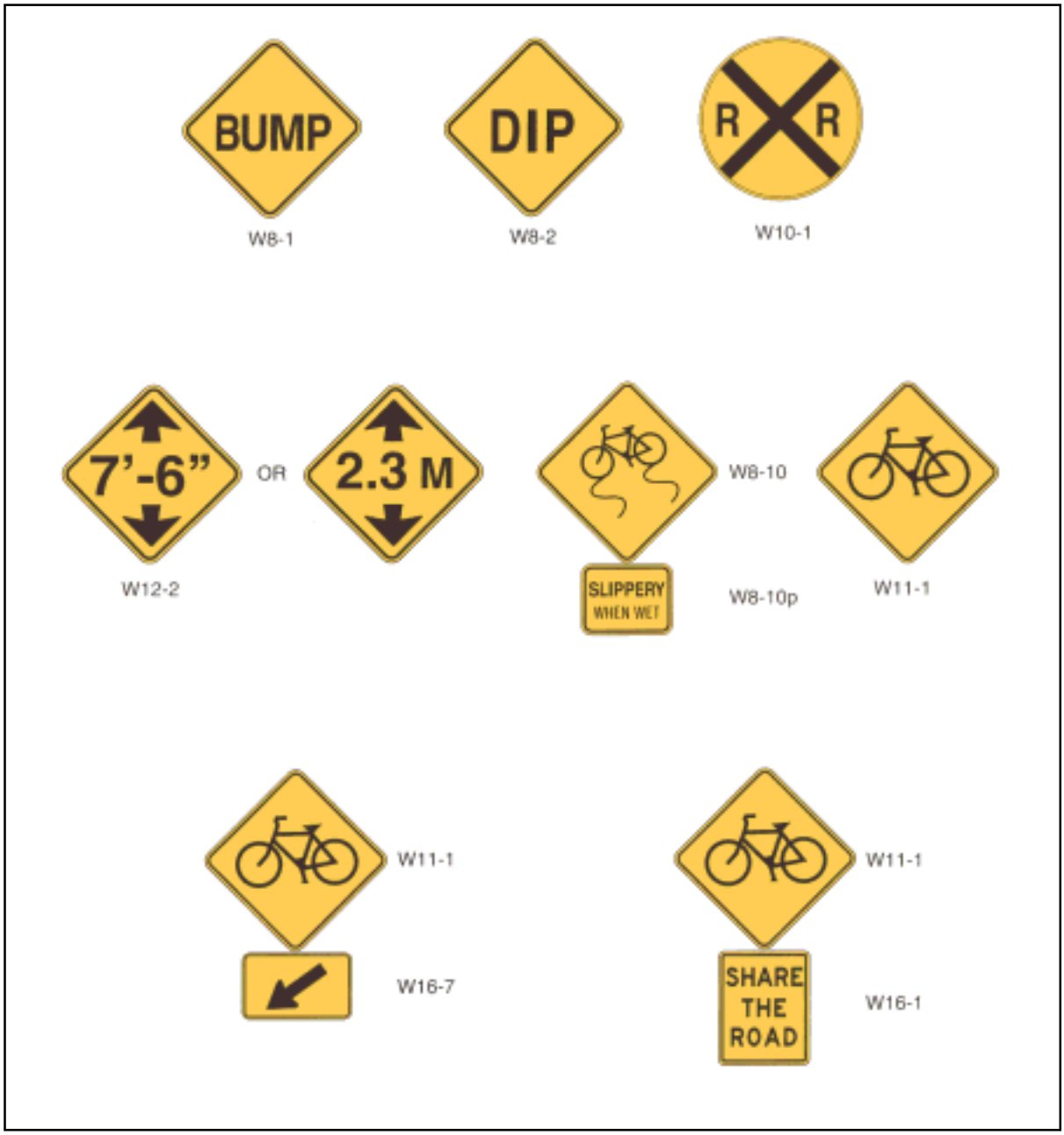


Figure 5.5. Bicycle Facilities Signage (Pages 5.12—5.15)
(Manual on Uniform Traffic Control Devices, June 2001)

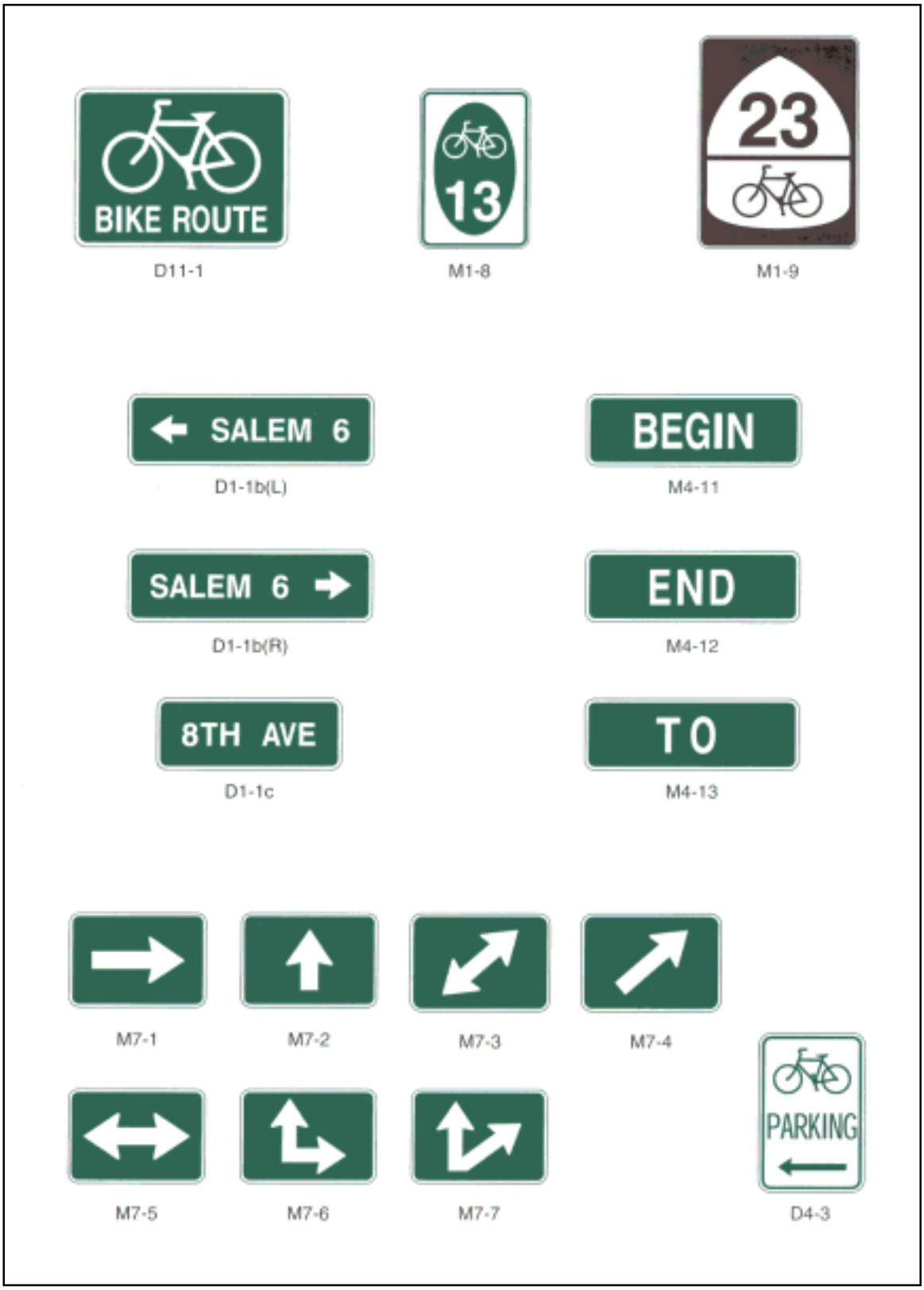


Figure 5.5. Bicycle Facilities Signage (Pages 5.12—5.15)
(Manual on Uniform Traffic Control Devices, June 2001)

INTERSECTIONS

Intersections should be designed so that a bicyclist's path of travel is direct, logical to both bicyclists and motorists, and is as similar to the path of motor vehicle travel as possible. Also, bike lanes should extend to the stop line/ crosswalk and should not extend through the pedestrian crossing.

T-Intersections

Bike lanes at T-intersections should be constructed according to the design illustrated in Figure 5.6. As shown, left and right turn lanes for bicycles should be provided unless severe physical constraints prevent the construction of two bicycle turn lanes. If physical constrains do exist, then the bicycle turn lanes can be omitted as long as the vehicular left turn lane is fourteen feet wide. With either design, the bike lane across from the intersection should be striped through the intersection. However, this bike lane should not be striped through the crosswalks.

Intersections Without Exclusive Right Turn Lanes

When a bike lane is present at an intersection that does not have an exclusive right turn lane, the solid bike lane stripe should be replaced with a dashed line at least 50 feet prior to the stop line/crosswalk.

Intersections With Exclusive Right Turn Lanes

At intersections with exclusive right turn lanes, the paths of motorists and cyclists should cross in advance of the intersection in order to reduce the number of conflicts that occur at the intersection. The pavement markings should direct bicyclists to the left of the exclusive right turn lane. As shown in Figure 5.7, the bike lane stripes should be dashed across the area where motorists should cross into the right turn lane. The solid bike lane markings should resume when the right turn lane achieves full width and should continue to the stop line/crosswalk. Under sever physical constraints, the bike lane can be terminated if the outermost through lane is fourteen feet wide.

Intersections With Dual Right Turn Lanes

At an intersection with a right turn lane and a shared through/right turn lane, the bike lane should terminate at the location where the taper for the right turn lane begins. A dashed line should be striped between the edge of pavement at the terminus of the bike lane to the lane stripe between the dual right turn lanes, as shown in Figure 5.8. The shared through/right turn lane should be fourteen feet wide. Also, signage alerting motorists and bicyclists of the approaching lane configuration is recommended.

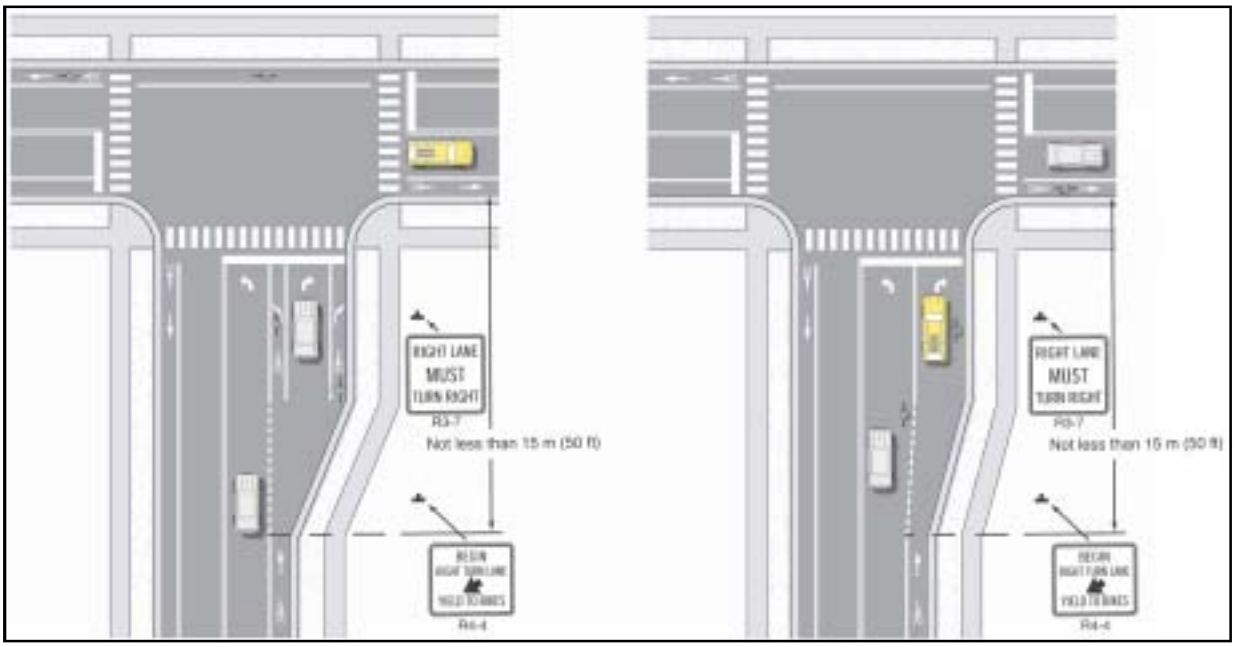


Figure 5.6. The left illustration shows the preferred lane marking configuration and signage for bike lanes at a T-intersection, which includes left and right turn lanes for bicycles. The right illustration shows a fourteen-foot wide shared left turn lane, which may alternatively be used at intersections when severe physical constraints exist.

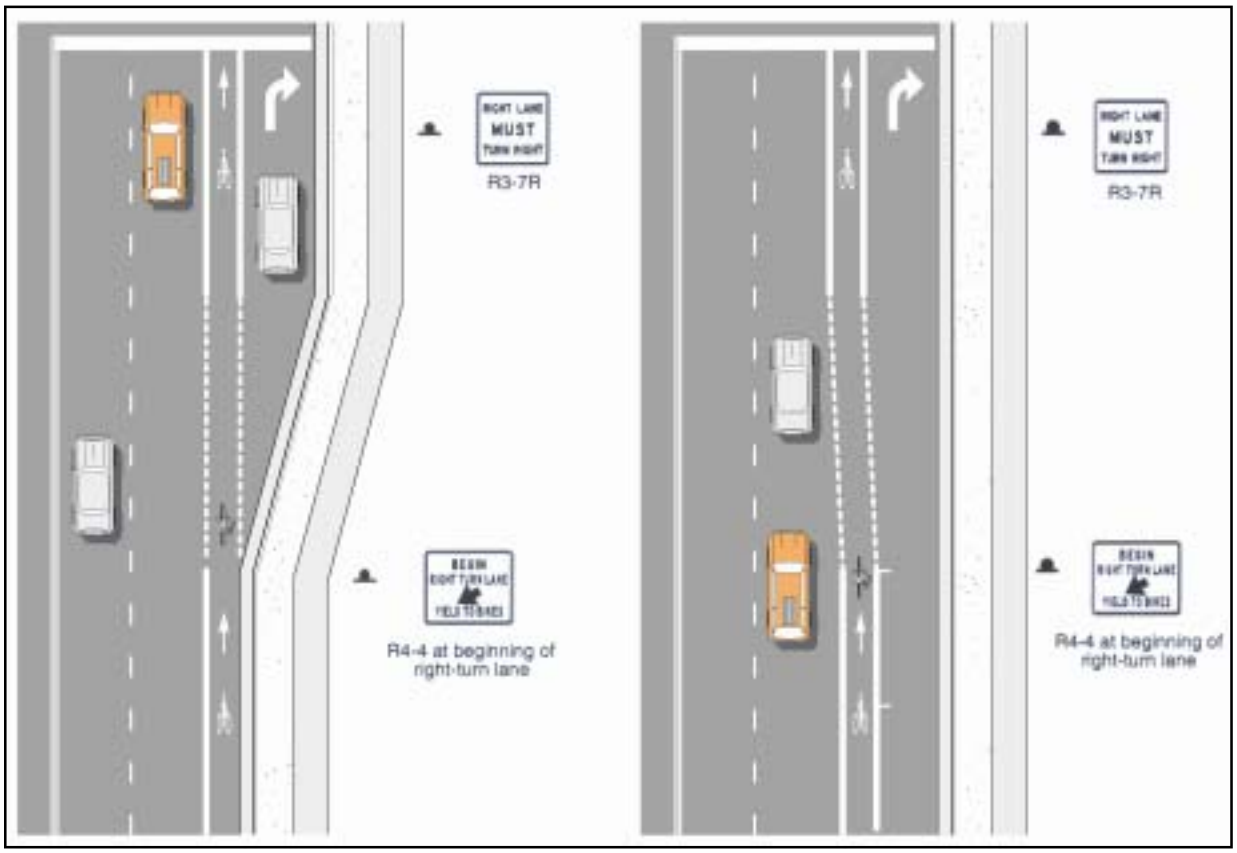


Figure 5.7. This figure shows the preferred lane marking configuration and signage for bike lanes at intersections with exclusive right turn lanes. The left illustration shows the preferred lane markings when on-street parking is not present. The right illustration shows the preferred lane markings when on-street parking is present.

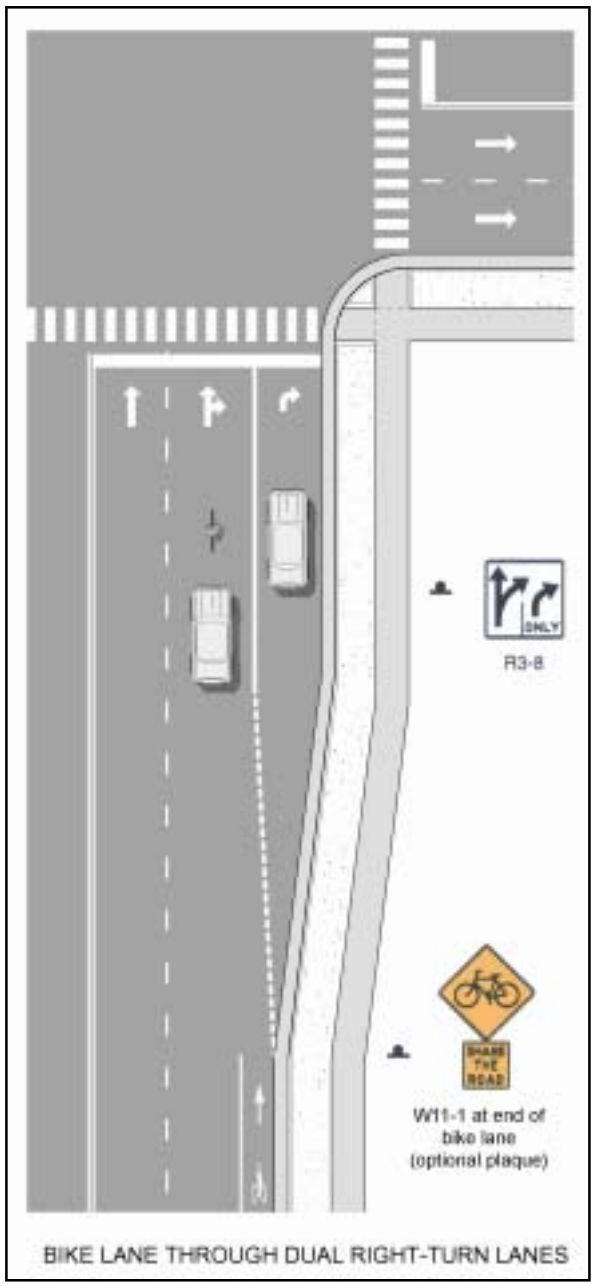


Figure 5.8. This illustration shows the preferred lane marking configuration and signage for a bike lane at an intersection that has dual right turn lanes.

Complex Intersections

Intersections of multiple roadways and intersections that have offset lanes or skewed streets can create confusion for motorists and bicyclists. When possible, these intersections should be realigned so that the intersecting roadways are perpendicular to each other, with only two roadways intersecting at a given point. If a complex intersection cannot be avoided, then bike lanes at the intersection should be defined with a dashed line strip through the intersection. However, the bike lanes should not be striped through the crosswalks.

SIGNAL TIMING AND DETECTION

Bicyclists are required to follow the rules of the road, including those related to traffic signals. Therefore, signal timing and detection should accommodate the needs of bicyclists.

Traffic signal clearance intervals are recommended to be timed to provide bicyclists with sufficient time to react, accelerate, and proceed through an intersection on the clearance interval. Normally, a bicyclist can travel through an intersection under the same signal phasing arrangement as motor vehicles. However, special consideration of bicyclists' needs may be necessary at multi-lane crossings and at acute angle intersections, which take longer to cross. The clearance interval should take into consideration a bicyclist's speed of 6-8 MPH, and a perception/reaction/braking time of 1.0 second.

Traffic detectors for traffic-actuated signals are recommended to be set to detect bicycles. The various types of detector loops that can be used are shown in Figure 5.9. Quadrupole and diagonal quadrupole loop detectors generally provide for bicycle detection, unlike standard loops, which are difficult to adjust to detect bicycles. Detectors should be located in the bicyclist's expected path of travel. When bicycle lanes are not present, pavement markings should be used to indicate where bicyclists should position themselves in order to activate the signal detector.

BICYCLE PARKING

Safe and convenient bicycle parking facilities should be provided at origin and destination points in Franklin. These facilities should be located close to building entrances and should be well-lit. Facilities that are not located close to building entrances should be in an active area, or should be monitored by a security camera or guard.

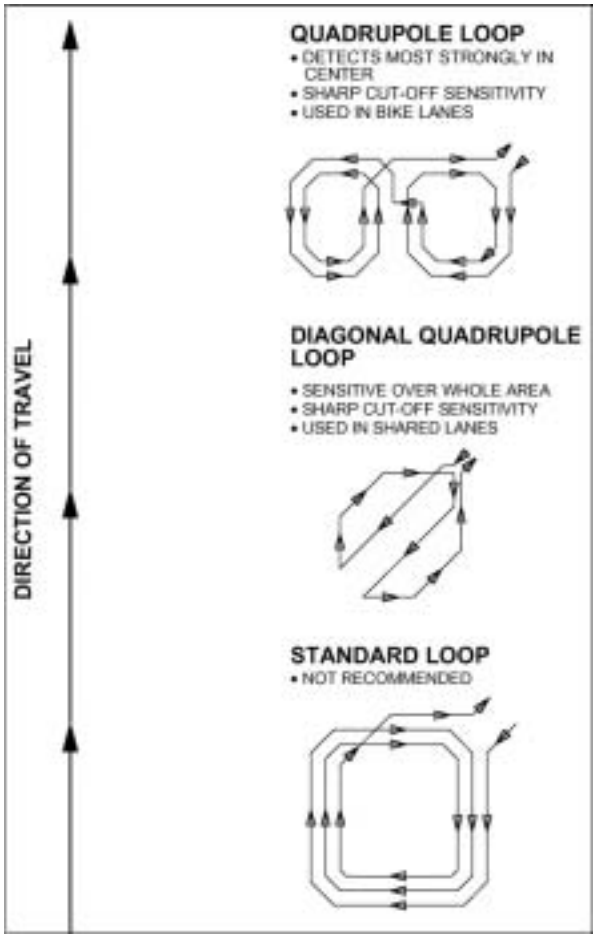


Figure 5.9. This figure illustrates the various types of detector loops for bicycle facilities.

When bike lanes are not present, pavement markings should be used at intersections to indicate to bicyclists where to position themselves in order to activate the signal detector.

Bicycle racks should be provided to serve short-term parking needs. Bicycle racks should accommodate high-security, U-type locks and should permit the frame and at least one wheel of each bicycle to be locked. These facilities should be securely anchored to the ground and should be covered in areas where bicycles may be left for long periods of time.

A locker, caged shelter, or a room within a building should be provided to serve long-term bicycle parking needs. These facilities should provide complete security for bicycles and accessories and should be protected from the weather.

Bike racks should be located near building entrances or in an active area.

Bike lockers are ideal for long term bicycle storage needs. They provide complete security, including protection from the weather, for a bicycle and its accessories.

OTHER RELATED DESIGN CONSIDERATIONS

All streets should be designed and maintained to eliminate safety hazards for bicyclists, regardless of the presence of a bicycle facility. For example, storm grates should be level with the pavement and should have bars that run perpendicular to the flow of traffic. Pavement surfaces should be smooth and should not have cracks or joints that run parallel to the flow of traffic. Streets should be swept regularly to remove debris. Also, roadway bridges and construction zones should be designed to accommodate bicycle traffic.

Storm sewer inlet grates that are level with the pavement surface and have bars that run perpendicular to the direction of travel are bicycle-safe.

Debris that collects on roadways can be hazardous to bicyclists. Streets should be swept regularly to eliminate this potential safety problem.

DESIGN STANDARDS

In general, AASHTO'S *Guide for the Development of Bicycle Facilities* should be used as the standard for making design decisions. Most local bicycle design standards in the United States are based on this guide. However, because the AASHTO guide is general in scope, many local bicycle design standards include refinements and additional guidance on specific design issues. For example, AASHTO provides basic coverage of intersection design, but because these locations can be major barriers to bicycle travel and are where most accidents occur, additional standards have been developed to augment the AASHTO guidelines. Several documents that can provide additional guidance on intersections and a range of other design issues include:

- *Nashville—Davidson County Strategic Plan for Sidewalks and Bikeways,* Metropolitan Government of Nashville and Davidson County, 2003
- *Oregon Bicycle & Pedestrian Plan,* Oregon Department of Transportation, 1995
- *North Carolina Bicycle Facilities & Design Guidelines*, North Carolina Department of Transportation, 1994
- *Madison Urban Area & Dane County Bicycle Transportation Plan*, Madison Area Metropolitan Planning Organization, 2000
- *Portland Bicycle Master Plan*, City of Portland, Office of Transportation, 1996

OTHER RECOMMENDATIONS

The City of Franklin should adopt the recommended LRBFP. Adoption of this plan will be the first step in the development of Franklin's bicycle network. Once the plan is adopted, Franklin must look for opportunities to fund the bicycle facilities, or have other entities, such as TDOT or developers, construct the recommended facilities. Also, once the bicycle facilities are in place, it is important that they be properly maintained. Thus, funding for ongoing maintenance should be included in the City's annual budget.

Adoption of the recommended LRBFP is not enough to ensure that bicycle planning will be an integral part of the overall planning process in

the City of Franklin. In order to effectively implement the recommended LRBFP, the City's Planning and Engineering staff should be familiar with bicycle planning, design issues, and standards. All roadway improvement plans that are developed by TDOT for roadways located in Franklin should be reviewed by the City staff to ensure that bicycle travel is adequately accommodated. Also, bicycle facilities should be considered for all new roadway projects that are constructed by Franklin. All site plans that are submitted to the City of Franklin for review and approval should also be evaluated to determine if their designs are compatible with bicycle travel. Many developers consider bicycle facilities to be amenities. However, the additional costs for such facilities are usually minimal. During the site planning process, Franklin should encourage developers to look for opportunities to incorporate new bicycle facilities into development plans. In particular, bicycle lanes on new collector roadways should be provided. Also, bicycle connections to adjacent subdivisions and to generators and attractors, such as schools, recreational facilities, and commercial centers, should be encouraged during the site planning process.

CHAPTER FIVE: RECOMMENDATIONS

B. PEDESTRIAN FACILITIES

INTRODUCTION

In recent years, the City of Franklin has made great strides in developing its pedestrian facilities network. This progress has been made possible by Franklin's existing, pedestrian–friendly regulations, which are discussed in Chapter Two. These regulations require that developers include sidewalks in most new commercial and residential subdivisions. They also include provisions for open spaces and standards that govern where and how sidewalks shall be placed. As a result, 81% of Franklin's citizens agree that the neighborhoods they live in are safe for pedestrians.[18]

The recommendations contained in this plan are intended to improve and expand Franklin's existing pedestrian facilities network. These recommendations will address the construction of new sidewalks, the maintenance of existing sidewalks, and other design-related issues.

RECOMMENDATIONS

NEW SIDEWALKS IN NEW DEVELOPMENTS

Franklin's current regulations require that sidewalks be constructed in most new commercial and residential subdivisions. These regulations should be revised to require that sidewalks be included in all residential, office/ commercial, and light industrial developments. Sidewalks in office/commercial and light industrial areas should be required to connect adjacent roads, parking lots, and building entrances.

In addition to requiring sidewalks in most new residential and office/commercial developments, the City of Franklin should consider the need for pedestrian facilities when evaluating all plans, including roadway plans, that are submitted to Franklin for approval and those that are prepared by City staff. This will ensure that opportunities to expand and improve the pedestrian network are not lost. This is particularly true for roadway plans. Sidewalks along roadways that connect dense or mixed land uses create opportunities for pedestrian trips that would otherwise be limited.

NEW SIDEWALKS ALONG EXISTING ROADWAYS

Although sidewalks are found in many recently-developed areas in Franklin, there are still many older areas and some newer areas that do not have sidewalks, but do have a strong potential to generate pedestrian trips. It is not feasible for Franklin to immediately construct sidewalks in all of these areas, so it is necessary to determine which areas have the highest priority for sidewalks. It is recommended that the City of Franklin apply an innovative concept, termed the Sidewalk Priority Index (SPI), that was developed by RPM Transportation Consultants, LLC to resolve this issue.

SIDEWALK PRIORITY INDEX (SPI)

The SPI uses a quantitative overlay method to evaluate the need for sidewalks at specific locations. Figure 5.10 illustrates how this method works. As shown, various factors that indicate a need for sidewalks are assigned weighted, numeric values that are based on each factor's potential to generate or impact pedestrian traffic. The factors are then grouped into categories, and each category is mapped. Each map is then overlaid onto the previous map until all maps have been combined. A numeric value, representing the need for sidewalks, is determined for each area by adding the values on each map. Each area evaluated can be ranked according to the resulting values. The higher the resulting value is, the higher the need for sidewalks is.

Table 5.4 identifies each factor used by the SPI and its associated value. As shown, the factors have been grouped into the following categories:

- Zoning Factors
- Trip Generator—0.5 Mile Radius Factors
- Other Factors

[18] *The 2000 Franklin Household Survey*, Franklin, Tennessee, March 2001

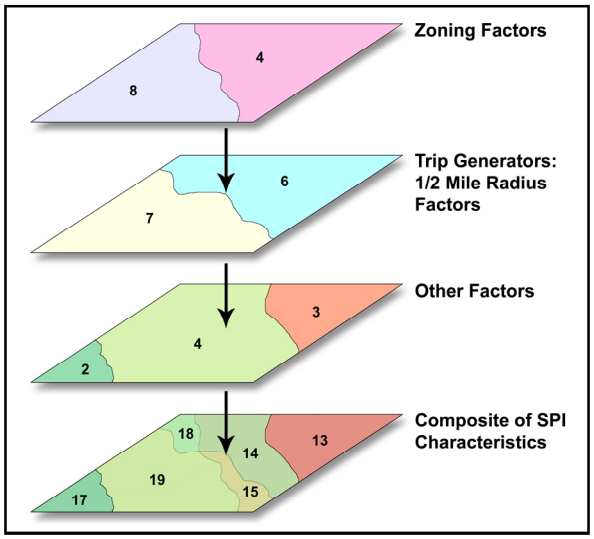


Figure 5.10. The Quantitative Overlay Concept Utilized by the SPI.

FACTORS		VALUE
ZONING FACTORS		
HR - High Residential PR - Planned Residential OR - Office Residential CC - Central Commercial PO - Planned Office PC - Planned Commercial		10
MR - Medium Residential GR - General Residential NC - Neighborhood Commercial GO - General Office GC - General Commercial		8
IC - Interstate Commercial LI - Light Industrial		6
ER - Estate Residential LR - Low Residential HI - Heavy Industrial		0
TRIP GENERATOR - 0.5 MILE RADIUS FACTORS		
Schools	Elementary/Middle School	10
	High School	7
Library/Civic Building		5
Park/Greenway		6
College/ University		5
Senior/Assisted Living Housing		8
Public Housing		10
Transit Route		7
OTHER FACTORS		
Arterial Roadway		4
Collector Roadway		2
Missing sidewalk segment, 0.25 mi or less in length, that connects to an existing sidewalk at both ends of the segment		6

Table 5.4. The SPI Factors and Values

The "Zoning Factors" category contains factors that represent land use and density. The "Trip Generator—0.5 Mile Radius Factors" category contains factors, or destinations in this case, that have a potential to generate walking trips within a half-mile radius of the identified destination. The "Other Factors" category contains factors that affect pedestrian travel, but that do not fit into the previous categories. The factors used by the SPI are described below. A calculation sheet for the SPI is included in Appendix B. It is important to note that SPI scores will change as properties are re-zoned, trip generator facilities are constructed, and roads are constructed. It is recommended that the City of Franklin automate the SPI so that the SPI factors can be updated as needed. Automating this SPI will also allow Franklin to quickly evaluate potential sidewalk locations as often as needed.

HR, PR, OR, PO, CC, and PC Zoning

Based on the density, permitted uses, and high potential for pedestrian activity, these zoning areas have been assigned a value of ten. Ten is the highest value of all SPI factors.

MR, GR, and NC Zoning

These zoning areas have characteristics that are similar to those in the previous category. However, they are not permitted to develop as intensely as those in the previous category. A value of eight has been assigned to these zoning areas.

IC and LI Zoning

Developments in these zoning areas tend to serve interstate traffic or attract people from outside the Franklin area. Examples of some uses that are permitted in these zoning areas include gas stations/convenience stores, large shopping developments, hospitals and warehouses. The IC and LI zoning areas have been assigned a value of six.

ER, LR, and HI Zoning

The ER and LR zoning areas contain very low-density, single-family residential developments. These developments consist of lots that are at least one acre in size and that tend to be spread out over a large area. The LI and HI zoning

areas contain industrial uses. Because these uses generate little, if any, pedestrian trips, they have been assigned a value of zero.

Elementary/Middle Schools

Because students who attend elementary/middle schools are too young to drive, these schools have a strong potential to generate walking trips. Also, elementary-age children do not yet have the skills that are necessary to predict the behavior of motorists or to judge the speeds and distances of vehicles. Therefore, areas within one-half mile of an elementary/middle school have been assigned a value of ten, the highest value of all SPI factors.

High Schools

Not all of the students who attend high schools are old enough to drive. Therefore, high schools have a somewhat-high potential to generate walking trips. High school-age children have developed skills that are needed to predict the behavior of motorists and to judge the speeds and distances of vehicles. Therefore, a value of seven has been assigned to areas within one-half mile of a high school.

Library/Civic Building

Libraries and civic buildings serve a wide range of users, including children, adults, senior adults, and disabled people. Areas within one-half mile of these facilities have been assigned a value of five.

Park/Greenway

Parks and greenways attract users of all ages, and they serve transportation, as well as recreational, needs. Therefore, areas within one-half mile of a park/greenway have been assigned a value of six.

College/University

Typically, colleges and universities generate a lot of pedestrian activity, with a majority of students living within walking distance. However, the colleges located in the Franklin area tend to serve students who live farther away, many of which may live outside of the Franklin area. Therefore, areas within one-half mile of a college/university have been assigned a value of five.

Senior/Assisted Living Housing

Many residents of senior/assisted living housing cannot drive or do not own a vehicle. Therefore, it is important to provide well-designed pedestrian facilities so that these residents can accomplish day-to-day activities, such as visiting friends, going to the grocery store, or going to the bank. Also, senior adults tend to have slower reaction times and, therefore, are vulnerable pedestrians. A value of eight has been assigned to areas that are located within one-half mile of senior/assisted living housing.

Public Housing

Many residents of public housing are completely dependent on walking or transit in order to go to work or to perform other day-to-day activities. Areas within one-half mile of public housing have been assigned a value of ten, which is the highest possible value.

Transit Route

In order for transit to be an effective form of transportation, sidewalks must connect transit routes to park-and-ride lots and other destinations. Therefore, areas located within one-half mile of the proposed transit route have been assigned a value of seven.

In order for Franklin's proposed transit system to be successful, it must be convenient. People must be able to safely and easily walk from their homes and businesses to the transit stops and visa versa. Therefore, providing sidewalks near the proposed transit route is a high priority.

Arterial Roadway

Arterial roadways provide direct access to many destinations. However, they also carry a high volume of relatively high-speed traffic. It is important to provide pedestrian facilities that are separated from traffic on these roadways. A value of four has been assigned to arterial roadways.

Collector Roadways

Collector roads provide access to many neighborhood destinations. They tend to have higher traffic volumes and higher speeds than local roads. As with arterial roadways, it is important to provide pedestrian facilities along collector roadways. Therefore, a value of two has been assigned to collector roadways.

Missing Segment

A missing sidewalk segment is considered to be a portion of an existing sidewalk that is missing, that is no longer than a quarter-mile, and that has the ability to connect to a sidewalk at both ends of the segment. This factor recognizes the benefit of completing an existing sidewalk facility. Missing sidewalk segments have been assigned a value of six.

Missing sidewalk segments can discourage many would-be pedestrians from walking for a given trip.

CROSS-SECTIONS

The recommended cross-sections for sidewalks are presented in Appendix A. These cross-sections should be used to construct sidewalks along both sides of a roadway. As shown, the cross-sections are dependent upon the classification of the roadway on which they are located. For additional information regarding roadway classifications and roadway cross-sections, see the *2003 MTPU*.

On a local or collector roadway (in a residential area) that has curb and gutter, the sidewalk should be five feet wide and should be constructed of concrete. The front edge of the sidewalk should be set back five feet behind the back of curb. This buffer area should be landscaped with grass and can include trees and other landscaping materials. Street signs, street lights, and other roadway appurtenances should be placed in the buffer area. Fire hydrants should be placed behind the sidewalk. A one-foot wide graded area, with a maximum 1:6 slope, should be provided at the back edge of the sidewalk.

On a collector roadway (in a commercial area) that has curb and gutter, the sidewalk should be eight feet wide and should be constructed of concrete. The front edge of the sidewalk should be set back five feet from the back of curb. This buffer area should be landscaped with grass and can include trees and other landscaping materials. Street signs, street lights, and other roadway appurtenances should be placed in the buffer area. Fire hydrants should be placed behind the sidewalk. A one-foot wide graded area, with a maximum 1:6 slope, should be provided at the back edge of the sidewalk.

On an arterial roadway that is in an urban area and has curb and gutter, the sidewalk should be eight feet wide and should be constructed of concrete. The front edge of the sidewalk should be set back six feet behind the back of curb. This buffer area can be landscaped with grass or can be constructed of concrete. Trees and other landscaping materials can also be used in the buffer area. Street signs, street lights, and other roadway appurtenances should be placed in this area. Fire hydrants should be placed behind the sidewalk. Buildings should be set back at least four feet from the back edge of the sidewalk, creating a frontage strip for the adjacent properties. This frontage strip should be constructed of concrete. Sidewalk cafes, sidewalk planters, benches, and other pedestrian features can be located in the frontage strip.

On an arterial roadway that is in a suburban area and has curb and gutter, the sidewalk should be five feet wide and should be constructed of concrete. The front edge of the sidewalk should be set back six feet from the back of curb. This buffer area should be landscaped with grass and can include trees and other landscaping materials. Street signs, street lights, and other roadway appurtenances should be placed in the buffer area. Fire hydrants should be placed behind the sidewalk. A one-foot wide graded area, with a maximum 1:6 slope, should be provided at the back edge of the sidewalk.

On a roadway that has ditches instead of curb and gutter, the sidewalk should be five feet wide and should be constructed of concrete. It should also be located behind the ditch. A one-foot wide graded area that has a maximum slope of 1:6 should be provided on each side of the sidewalk. The buffer, which contains the ditch and is located between the innermost graded area and the edge of the roadway, should be five feet wide and should be landscaped with grass. If severe physical constraints will not accommodate this cross-section, then an alternate cross-section can be considered. Under this scenario, a five-foot wide paved shoulder could be constructed adjacent to the edge of the roadway. This shoulder could be used by pedestrians or bicyclists. A one-foot wide graded area that has a maximum slope of 1:6 could be provided at the back edge of the shoulder. The ditch could be located behind this graded area.

ACCESS MANAGEMENT

Unlimited access creates many points where conflicts may occur between pedestrians and vehicles entering or leaving the roadway. By restricting the number and size of driveways along a roadway, many of these potential conflicts can be avoided. This concept is illustrated in Figure 5.11. Multiple driveways that have multiple lanes and continuous access driveways should be avoided. When possible, multiple driveways should be combined. If these driveways serve adjacent properties, cross-access drives between the properties should be provided in order to eliminate the need for multiple driveways. These recommendations are consistent with Franklin's current access ordinance. Continuous access driveways should be re-designed to create a limited number of entry/exit points. This design should include grass buffer strips between the roadway and the parking lot to prevent access at unwanted locations.

INTERSECTIONS

All intersections should be designed with the assumption that pedestrians will be present. They should have crosswalks that are clearly marked. They should also have ramps, landings, pedestrian push buttons, and other pedestrian features that are accessible to everyone. The signage and pavement markings at intersections should clearly indicate how all roadway users should operate.

Continuous access driveways should be avoided in order to reduce the number of conflict points between pedestrians/ bicyclists and motorists.

Sidewalk Ramps

A sidewalk ramp should be constructed for each crosswalk at each street corner, as illustrated in Figure 5.12. In addition to providing the shortest, direct route between sidewalks, this practice makes it easier for pedestrians crossing the street to see right-turning vehicles. If only a single, diagonal sidewalk ramp is provided at a street corner, then right-turning vehicles approach pedestrians crossing the intersecting street from behind. If two perpendicular sidewalk ramps are provided, then right-turning vehicles will approach the pedestrians from the side. This concept is illustrated in Figure 5.13.

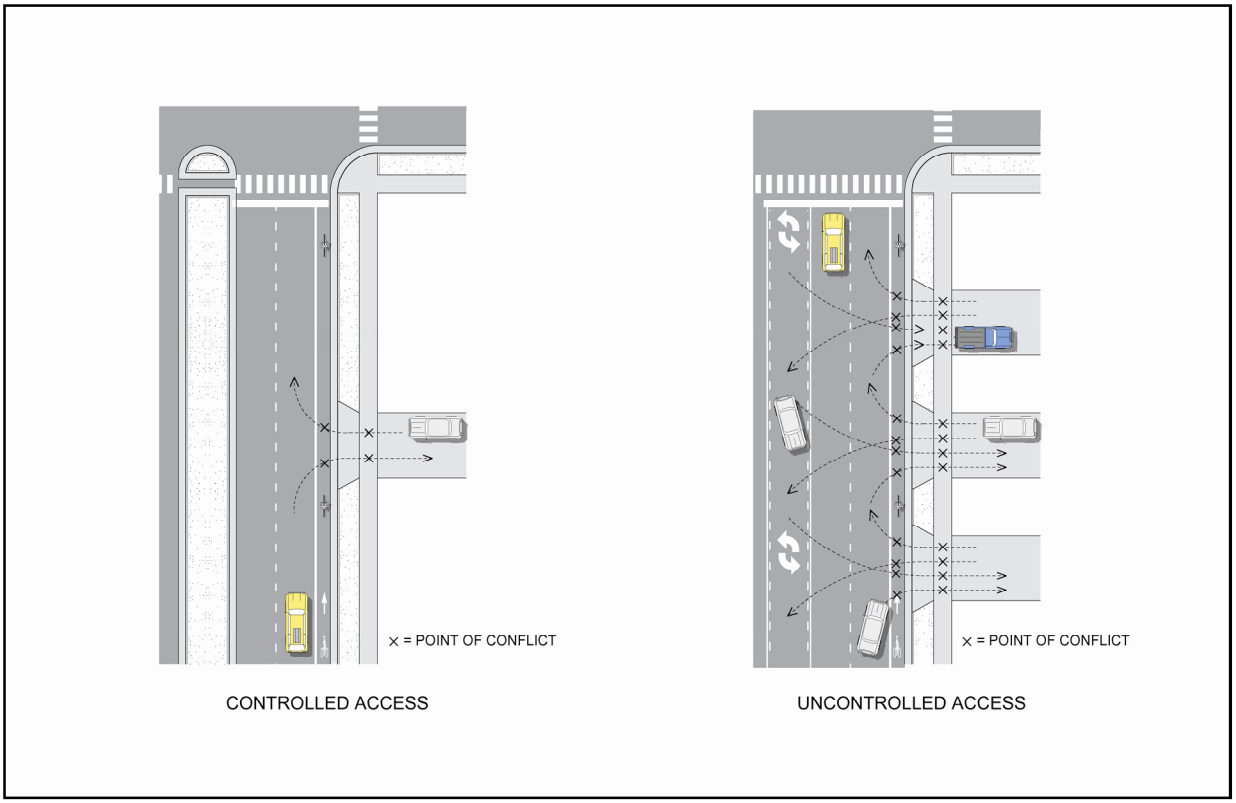


Figure 5.11. This figure shows how access management can reduce the number of conflict points between pedestrians/bicyclists and motorists.

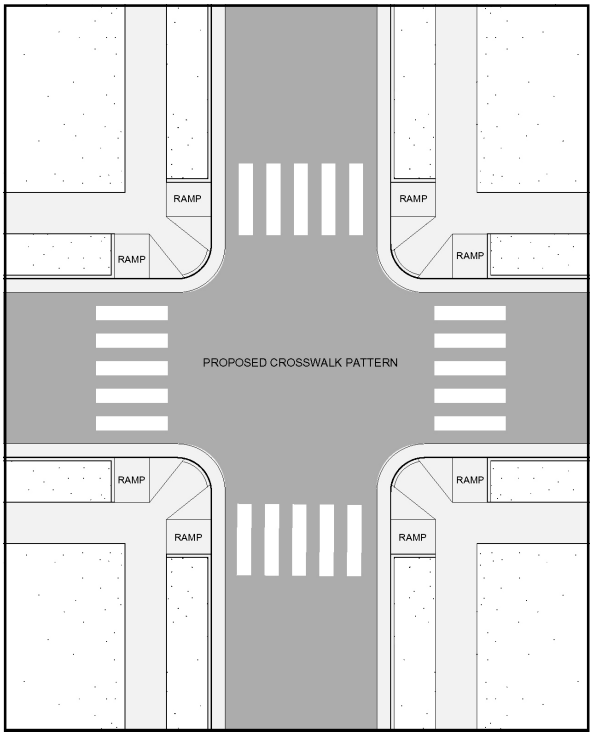


Figure 5.12. A sidewalk ramp should be constructed for each crosswalk at an intersection. This practice provides the shortest, direct route between sidewalks. It also prevents wheelchair users from having to re-align their wheel chairs while in the street in order to remain in the crosswalk. The crosswalks should be marked with zebra patterns so that they are highly visible to all roadway users.

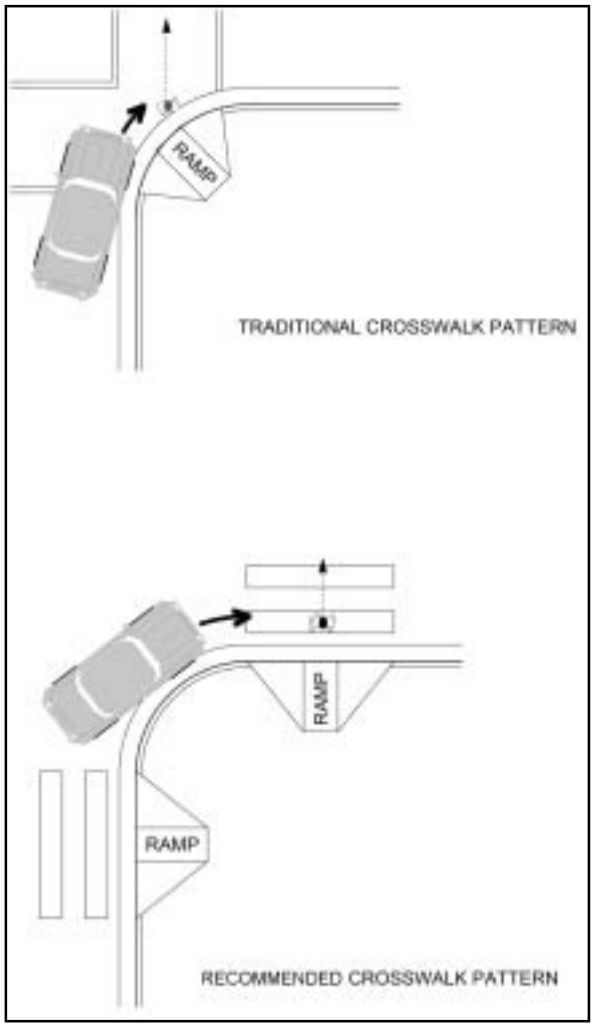


Figure 5.13. Motorists and pedestrians are more visible to each other when two sidewalk ramps are provided at each street corner.

Corners

An obstruction-free area should be provided at street corners between the curbs and a continuation of the adjacent property lines, as shown in Figure 5.14. At a minimum, this distance should be ten feet. Only pedestrian push button posts and other pedestrian features should be located in this area.

CROSSWALKS

Crosswalks should be provided on each leg of all intersections. They should be clearly marked with a zebra pattern, as shown in Figure 5.12, so that they are highly-visible to all roadway users. Crosswalks that are marked with

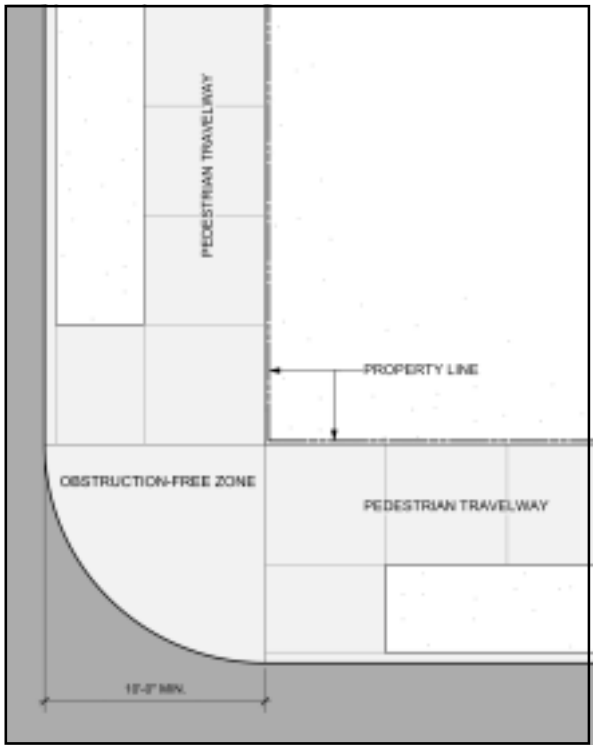


Figure 5.14. Street corners should provide an obstruction-free area.

reflective white thermoplastic tape are more visible than those that are marked with brick or cobblestone, especially at night and during rain. Crosswalks that are marked with brick or cobblestone can be made more visible by outlining them with reflective white thermoplastic tape. However brick and cobblestone are not recommended for crosswalks because these materials can create bumpy paths that are difficult for people with limited mobility to navigate.

PEDESTRIAN SIGNALS

The *MUTCD* identifies the situations in which pedestrian signal shall be used and the situations in which pedestrian signals should not be used. Because one should assume that pedestrians will be present at all intersections, all signalized intersections should be designed to accommodate pedestrians. Other locations that have high pedestrian volumes may also warrant the installation of a dedicated pedestrian actuated traffic signal.

Pedestrian Push Buttons

Pedestrian pushbuttons should be used at pedestrian crossings that have low, intermittent pedestrian volumes. The design and placement of pedestrian pushbuttons should meet the following criteria:

- The pushbutton should be located a maximum of five feet away from the extension of the crosswalk lines and within ten feet of the curb/shoulder/pavement.
- If two pushbuttons are located on the same street corner, they should be separated by at least ten feet.
- The pushbutton should be accessible to a person standing on the level landing at the top of the sidewalk ramp.
- The pushbutton box should face the pedestrian standing at the curb on alignment with the crosswalk.
- An arrow should clearly indicate which crosswalk will be affected by the pushbutton.
- Standard pedestrian signal instructions should be mounted near the pushbutton.
- A pushbutton should be present at each leg of a signalized intersection that does not have a fixed-time pedestrian phase.
- The pushbutton should include an illuminated confirmation light to acknowledge that a call has been detected.

Pedestrian Signal Timings

The *MUTCD* and the *ADA Accessibility Guidelines for Buildings and Facilities* should be consulted regarding pedestrian signal timings. However these documents contain some differences. Each of these documents should be reviewed, and the most stringent requirements should be applied when designing pedestrian signal timings.

Pedestrian signals should utilize universal symbolized messages, as outlined in the *MUTCD*, rather than letters. The *MUTCD* uses the term "Walking Person" to describe the white illuminated figure that symbolizes the WALK interval. The "Upraised Hand" is used to describe the orange illuminated figure that symbolizes the DON"T WALK interval.

According to the *MUTCD*, a minimum of seven seconds should be allocated to the WALK signal. The amount of time dedicated to the DON"T WALK signal should be based on the pedestrian walking speed and the crossing distance. According to *ADA Accessibility Guidelines for Buildings and Facilities*, a pedestrian walking speed of 3.5 feet per second should be assumed at all intersections. This document also states that the crossing distance should equal the length of the crosswalk plus one sidewalk ramp.

DETECTABLE WARNING SURFACES

The *Draft Guidelines on Accessible Public Rights* calls for detectable warnings for pedestrian street crossings, including curb ramps and blended transitions, certain median and refuge islands, and rail lines. These surfaces feature a distinctive pattern of raised domes to provide a tactile cue detectable by cane or underfoot at the boundary between pedestrian and vehicular routes.

TRANSIT STOPS

Transit stops should be located at the far side of an intersection, as shown in Figure 5.15. This design encourages pedestrians to cross behind the bus, improving their visibility to oncoming vehicles. A bus stop located on the near side of an intersection blocks the site lines between pedestrians and motorists.

The preferred location for a transit stop waiting area is in the buffer strip between the sidewalk and the roadway. This waiting areas should be at least eight feet wide by twenty-five feet long and should be constructed of concrete.[17] If severe physical constraints require the transit stop to be located outside of the buffer strip, then the transit stop should be located in the frontage strip. This design should include a concrete waiting area that is at least six feet wide by twelve feet long.[17]

[17] www.pacebus.com/content/documents/devguidelines/waitarea.htm

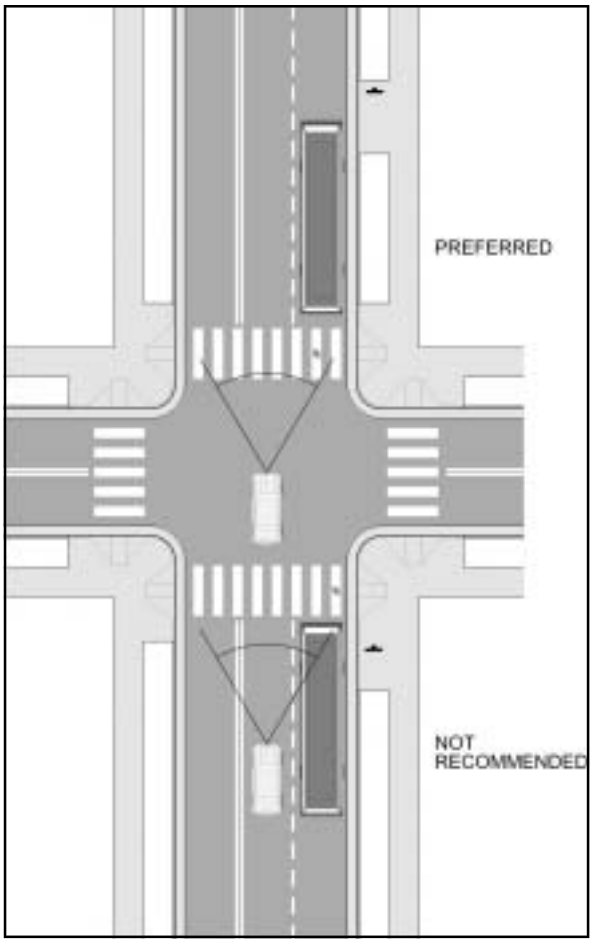


Figure 5.15. This figure illustrates how the location of a transit stop can affect motorists' visibility of pedestrians crossing the roadway.

CHAPTER FIVE: RECOMMENDATIONS

C. EDUCATION, ENCOURAGEMENT, & ENFORCEMENT

INTRODUCTION

Perhaps the most effective way to improve the safety of bicycling and walking in Franklin is to provide more well-designed bicycle and pedestrian facilities. For example, providing bike lanes results in less competition for roadway space and discourages bicycling on sidewalks. If sidewalks are provided, pedestrians are encouraged to walk on the sidewalks instead of in the street. However, providing well-designed facilities does not, by itself, make a pedestrian and bicycle program successful. Education and encouragement programs are critical elements that increase bicycling and walking and the safety of bicyclists and pedestrians. Enforcement efforts ensure proper use of public right-of-way, which increases safety for all right-of-way users.

Bicycle and pedestrian education for children is most effective when taught through hands-on activities.

EDUCATION AND ENCOURAGEMENT

Adult and youth bicyclists, as well as motorists, need to know how to properly operate in Franklin's right-of-way and how to properly share the road safely. An effective education program will improve bicycling skills, reduce accidents, and increase the use of bicycle helmets. Education, when coupled with promotional activities, will encourage more people to feel confident when bicycling, and will maximize use of the facilities.

CHILDREN

Children are most effectively reached with hands-on activities and a repetitive practice process that is coupled with awards and incentives. To reach most children, it is important to work closely with schools to ensure that they receive age-appropriate bicycle safety messages.

The City of Franklin should work with the TMA Group to integrate a bicycle and pedestrian safety element into physical education classes at public elementary schools. In the past, the TMA Group has worked with teachers and others on bike rodeos, which have been held on weekends. This event could be expanded into the classroom. Educational materials that can be used for this purpose include the *Guide to Bike Rodeos*, published by the Adventure Cycling Association, and *The Basics of Bicycling,* published by the Bike Federation of America. In addition, TDOT has produced an educational video entitled *Safe Cycling – Do You Know the Rules?* Other school-related activities could include an annual "Walk-to-School Day".

The City of Franklin should also produce a well-illustrated bicycle and pedestrian safety pamphlet that is directed at children, which can augment school-based bike rodeos. Such a pamphlet would also be of value to those who have not been to a rodeo. A child can take such a pamphlet home and continue to build bicycling skills, perhaps practicing with a parent.

ADULTS

Unlike children, adults are not as easily reached by bicycling and pedestrian education programs. Many adults assume that there is little to learn about bicycle and pedestrian safety. As a result, these programs should focus on those who are already motivated, or have an interest, in bicycling and walking. However, efforts should be made to increase awareness of the benefits of bicycling and walking.

The Harpeth Bike Club offers bicycling education and other bicycle-related information and activities to adults who are interested in bicycling.

Adult educational programs are occasionally offered by the Harpeth Bike Club. The City of Franklin should consider providing some assistance for these programs to ensure that the programs continue to be offered. The City of Franklin should also help promote these programs through the City's website.

Franklin should also develop an educational pamphlet directed at adult bicyclists and pedestrians. The pamphlet should present the rules of the road, riding tips, and information about Franklin's bicycle and pedestrian facilities. The pamphlet could be distributed through the Parks Department and at bike shops. It could also be promoted through press releases and public service announcements.

In addition to these activities, the City of Franklin should work with the TMA Group to encourage employers to offer incentives to employees who commute by bicycling or walking. For example, employers could provide shower facilities for non-motorized commuters. Currently, the TMA Group offers a guaranteed ride home service, which could be very helpful to non-motorized commuters.

MOTORISTS

Motorists may be the least motivated to learn about safely sharing the road with bicyclists and pedestrians. In fact, many motorists do not realize that bicyclists and pedestrians are legal users of public right-of-way. Therefore, bicycling education programs for motorists should focus on a general awareness and respect for bicyclists and pedestrians.

Bicycling education programs for motorists should focus on a general awareness and respect for bicyclists and pedestrians. They should also emphasize that bicyclists and pedestrians are legal users of public right-of-way.

The City of Franklin should develop simple, educational brochures for motorists that emphasize the "share the road" message. These brochures could be distributed at the Department of Motor Vehicles offices and could be inserted into utility bills. Public service announcements should also be developed to spread this message.

OTHER EDUCATION AND ENCOURAGEMENT EFFORTS

In addition to the above education and encouragement activities, the following efforts are recommended:

- A bikeway map that identifies all on-street and off-street bicycle facilities, along with basic rules of the road and other information, should be produced for the Franklin area. Such a map would be of interest to residents as well as tourists. Franklin should consider partnering with Williamson County and the City of Brentwood in order to include a larger region in the map.
- The City of Franklin's website should include comprehensive bicycling and pedestrian information. The Franklin Bicycle & Pedestrian Page can include the contents of this plan,

downloadable bike map files, educational information, and the City's bicycle and pedestrian-related ordinances. In addition, the website can allow visitors to order hard copies of educational brochures or buy the bike map.

- The City of Franklin, the TMA Group, and others should sponsor a Bike/Walk-to-Work Day or Bike/Walk-to-Work Week. The scope of the event could be expanded to include transit use. The purpose of the event would be to increase the public awareness of the benefits of non-motorized travel. Such an event would be an excellent opportunity to promote existing and future bicycle and pedestrian facilities in Franklin.

ENFORCEMENT

By adopting the procedures and programs outlined in this plan, safe and desirable transportation facilities can be provided for bicyclists and pedestrians in the City of Franklin. However, enforcement also has an important role. The same traffic laws that apply to motorists also apply to bicyclists. Police enforcement of traffic laws for bicyclists, pedestrians, and motorists, is necessary to ensure adherence.

POLICE OFFICERS

Police officers who are unfamiliar with bicycle and pedestrian-related issues may focus more on motorists' safety than the safety of bicyclists and pedestrians. This can discourage many would-be bicyclists and pedestrians. It is recommended that the Franklin Police Department conduct training sessions that address bicycle and pedestrian-related enforcement issues.

BICYCLISTS

Bicyclists who are unfamiliar with the rules of the road can threaten the safety of all right-of-way users. Law Enforcement is necessary to protect public safety and increase awareness of proper riding procedures. Successful bicycle enforcement programs tend to focus on bicyclists' behaviors that contribute to the most bicycle/motor vehicle crashes. These behaviors are:

- Bicycling against the flow of traffic
- Bicycling at night without headlamps
- Failing to obey stop signs, traffic signals, and yield signs at intersections

The Franklin Police Department should issue citations to bicyclists who perform these actions. This method will provide Franklin with an effective way to raise bicyclists' awareness and protect public safety, while using a limited amount of enforcement resources. Police officers on bicycles are an excellent resource for this type of enforcement.

The presence of police officers patrolling on bicycles increases public awareness of bicycle and pedestrian-related issues.

PEDESTRIANS

Generally, pedestrian enforcement issues are more effectively addressed through education and encouragement efforts than by issuing citations. However, there is an exception. Alcohol-impaired pedestrians are involved in a high percentage of all fatal pedestrian/motor vehicle crashes. Therefore, pedestrian enforcement efforts should target alcohol-impaired pedestrians.

MOTORISTS

Many motorists do not realize the dangers that their behaviors pose to bicyclists and pedestrians. Others do not care. Behaviors such as speeding, aggressive driving, and other intimidation tactics that are directed at bicyclists and pedestrians discourage many would-be bicyclists and pedestrians. However, police officers can not be on

every street all of the time. Therefore, streets should be designed to encourage appropriate travel speeds and promote a bicycle/pedestrian-friendly atmosphere. Enforcement efforts should focus on areas that have a high number of crashes and areas that attract a large number of bicyclists and pedestrians. Motorists who do not yield to bicyclists and pedestrians executing legal maneuvers should be issued citations. This type of enforcement activity tends to be more effective when such activities are widely publicized.

CHAPTER SIX: COST ESTIMATES & FUNDING SOURCES

INTRODUCTION

The LRBFP presented in Chapter Five identifies an extensive network of bikeways that is recommended for Franklin. Some of these facilities, such as those that only require signage and pavement markings, will have only minor costs and can be implemented right away. However, other facilities, such as those that will require roadway widening and right-of-way acquisition, may involve much higher costs and will be more difficult to implement. These facilities may be more easily implemented if they are incorporated with routine or planned roadway projects.

The City of Franklin should include funding for bikeway projects in its annual budget. The capital allocated each year for bikeway projects should depend upon the costs associated with completing the LRBFP and the time frame in which Franklin intends to complete LRBFP projects. In order to assist Franklin in determining the cost implications of the LRBFP projects, cost estimates were developed for each recommended bicycle facility. Funding sources were also identified in order to facilitate the implementation process.

COST ESTIMATES

Cost estimates were developed for the bikeways recommended in the LRBFP and the LRBFP - Phase I Recommendations. With the exception of right-of-way acquisition and grading, these estimates identify the costs of the bicycle component for each of the recommended facilities. They do not include costs for other work that may be done in conjunction with the bikeway projects, such as costs for new road construction, pavement overlays, utility relocations, and other similar costs. Also, the costs identified in the estimates are in 2003 dollars.

The cost estimate for the LRBFP is presented in Table 6.1. As shown, implementation of all of the recommended facilities is estimated to cost approximately $24,759,000. Table 6.2 identifies the costs associated with the facilities included in the LRBFP—Phase I Recommendations. It is estimated that the Phase I facilities will cost approximately $7,983,000.

FUNDING SOURCES

As part of the two most recent transportation-funding bills, Congress has mandated that bicyclists and pedestrians be a more integral part of the nation's transportation system. The most recent transportation bill, the Transportation Equity Act for the 21st Century (TEA-21), states that, "Bicycle transportation facilities and pedestrian walkways shall be considered, where appropriate, in conjunction with all new construction and reconstruction of transportation projects, except where bicycle and pedestrian use are not permitted." To facilitate the construction of these facilities, TEA-21 includes a variety of funding sources for bicycle and pedestrian-related projects. Other funding sources are also available. The following text describes funds that Franklin should consider when implementing the recommendations contained in the *2003 BPPU*.

TEA-21

TEA-21 authorizes the Federal Surface Transportation programs for highways, highway safety, and transit for the six year period from 1998-2003. There are general, state, and local improvements for highways and bridges that accommodate additional modes of transit. These improvements include capital costs, publicly owned intercity facilities, and bicycle and pedestrian facilities. TEA-21 will expire on September 30, 2003.

BRIDGE REPLACEMENT AND REHIBILITATION PROGRAM (BRR)

All bridge projects are eligible to receive funding through the BRR program. When federal funds are used to replace or rehabilitate a highway bridge deck, the bridge deck must provide bicycle

Road Name	From	To	Facility Type	Length (Miles)	Cost
1st Avenue	Bridge Street	S. Margin Street	Signed Shared Roadway	0.4	$4,000
3rd Avenue	Bridge Street	Main Street	Signed Shared Roadway	0.1	$2,000
5th Avenue	Bridge Street	W. Main Street	BR	0.1	$2,000
5th Avenue	W. Main Street	S. Margin Street	BR	0.2	$3,000
7th Avenue	Columbia Pike	5th Avenue	BR	0.1	$2,000
Arno Road*	Highway 96	Study Boundary	Wide Outside Lanes	2.1	$24,000
Aspen Grove Drive	Seaboard Lane	Jordan Road	Bike Lanes	0.6	$26,000
Bakers Bridge Avenue	Seaboard Lane	Carothers Parkway	Wide Outside Lanes	1	$25,000
Boyd Mill Avenue (West)*	Highway 96 W.	Downs Boulevard	Bike Lanes	0.6	$17,000
Bridge Street	5th Avenue	3rd Avenue	Signed Shared Roadway	0.2	$3,000
Bridge Street	3rd Avenue	1st Avenue	Signed Shared Roadway	0.1	$2,000
Carlisle Lane	Del Rio Pike	Highway 96 W.	Bike Lanes	0.7	$20,000
Carothers Parkway*	Moores Lane	Liberty Pike	Multi-Use Path	3.1	$1,660,000
Carothers Parkway	Quail Hollow Court	Highway 96	Multi-Use Path	0.2	$108,000
S. Carothers Road*	Highway 96	Goose Creek Bypass	Multi-Use Path	4.1	$2,195,000
S. Carothers Road*	S. Carothers Road, South of Upland Drive	Arno Road	Wide Outside Lanes	2.8	$19,000
Carters Creek Pike*	Downs Boulevard	Southern Boundary	Bike Lanes**	3.2	$76,000
Church Street	1st Avenue	5th Avenue	Signed Shared Roadway	0.3	$3,000
Coleman Road*	Columbia Pike	Western Boundary	Bike Lanes	0.4	$11,000
Columbia Avenue*	Southern Boundary	Downs Boulevard	Bike Lanes**	5.5	$207,000
Columbia Avenue	Downs Boulevard	5th Avenue	Signed Shared Roadway	1.1	$15,000
Cool Springs Blvd.*	Carothers Parkway	Liberty Pike	Bike Lanes	2	$83,000
Cool Springs Blvd.*	Mack Hatcher Pkwy.	Frazier Road	Multi-Use Path	1.1	$609,000
Cotton Road / Del Rio Pike*	Berry's Chapel Road	Southern Terminus	Bike Lanes	1.9	$46,000
Del Rio Pike*	Carlisle Lane	Poplar Grove Grade School	Bike Lanes	0.7	$17,000
Del Rio Pike*	East Del Rio Pike Split	Hillsboro Road	Bike Lanes	0.4	$11,000
Downs Boulevard	Columbia Avenue	Highway 96 W.	Bike Lanes	2.7	$64,000
Franklin Road*	Northern Boundary	Liberty Pike	Bike Lanes**	3.5	$83,000
Franklin Road*	Liberty Pike	1st Avenue	Signed Shared Roadway	0.3	$3,000
Frazier Road	Cool Springs Blvd.	Mallory Lane	Multi-Use Path	0.3	$162,000
Gen. Geo. Patton Dr.	Northern Boundary	Mallory Station Rd.	Bike Lanes	0.6	$26,000
Goose Creek Bypass*	Columbia Avenue	Peytonsville Road	Bike Lanes	3.5	$132,000

*Part or all of this roadway segment is recommended to be improved in the *2003 MTPU*.
**Shoulder bike lanes should be provided.

Table 6.1. Cost Estimate for the LRBFP Recommendations (Pages 6.2—6.4)

Road Name	From	To	Facility Type	Length (Miles)	Cost
Goose Creek Bypass*	Peytonsville Road	Long Lane	Wide Outside Lanes	0.4	$10,000
Goose Creek Bypass*	Long Lane	Eastern Boundary	Bike Lanes	0.5	$20,000
Harpeth River	Cotton Road	Mack Hatcher Pkwy.	Multi-Use Path	4.8	$2,569,000
Harpeth River	Mack Hatcher Pkwy.	Ploughmans Bend Drive	Multi-Use Path	0.7	$376,000
Harpeth River	Ploughmans Bend Drive	1st Avenue	Multi-Use Path	1.2	$643,000
Harpeth River	1st Avenue	Pinkerton Park	Multi-Use Path	0.4	$215,000
Harpeth River	Pinkerton Park	Eastern Boundary	Multi-Use Path	11.1	$5,940,000
Henpeck Lane	Columbia Avenue	Lewisburg Avenue	Bike Lanes	2.2	$53,000
Highway 96	Mack Hatcher Pkwy.	S. Margin Street	Wide Outside Lanes	1.3	$16,000
Highway 96	I-65	Eastern Boundary	Bike Lanes**	4.4	$104,000
Highway 96 W.*	Western Boundary	7th Avenue	Bike Lanes**	4.3	$162,000
Highway 96 W.	7th Avenue	5th Avenue	Signed Shared Roadway	0.1	$2,000
Hillsboro Road*	Bridge Street	Northern Boundary	Bike Lanes**	2.9	$83,000
Horton Lane*	Boyd Mill Avenue	Winberry Drive	Bike Lanes	0.3	$9,000
Jordan Road	Aspen Grove Drive	Mallory Lane	Wide Outside Lanes	0.2	$3,000
Lewisburg Avenue*	Harpeth River	Southern Boundary	Bike Lanes**	5.3	$125,000
Liberty Pike	Franklin Road	Liberty Road	Signed Shared Roadway	2.4	$27,000
Liberty Pike Extension*	Eastern Terminus	Wilson Pike	Bike Lanes	0.7	$17,000
Liberty Road	Liberty Pike	McEwen Drive	Signed Shared Roadway	0.6	$7,000
Mack Hatcher Pkwy. (Existing Road)	Columbia Avenue	Hillsboro Road	Multi-Use Path	5.7	$3,051,000
Mack Hatcher Pkwy. (Future Road)	Hillsboro Road	Columbia Avenue	Multi-Use Path	6.8	$3,639,000
Main Street	3rd Avenue	1st Avenue	Signed Shared Roadway	0.2	$3,000
W. Main Street	Downs Boulevard	5th Avenue	Signed Shared Roadway	1.6	$19,000
Mallory Lane*	Frazier Road	Jordan Road	Multi-Use Path	0.2	$108,000
Mallory Lane*	Jordan Road	Liberty Pike	Bike Lanes	1.1	$27,000
Mallory Station Road	Franklin Road	Seaboard Lane	Bike Lanes	1	$25,000
McEwen Drive*	Cool Springs Boulevard Extension	Wilson Pike	Bike Lanes	1.5	$36,000
McEwen Drive Extension*	Wilson Pike	Clovercroft Road	Bike Lanes	1.2	$29,000
Moores Lane	Franklin Road	Northern Boundary	Bike Lanes	0.6	$15,000
North Chapel Road*	Relocated Wilson Pike	Highway 96	Bike Lanes	2.1	$60,000
Peytonsville Road*	Goose Creek ByPass	Southern Boundary	Bike Lanes	0.6	$15,000

*Part or all of this roadway segment is recommended to be improved in the *2003 MTPU*.
**Shoulder bike lanes should be provided.

Table 6.1. Cost Estimate for the LRBFP Recommendations (Pages 6.2—6.4)

Road Name	From	To	Facility Type	Length (Miles)	Cost
N. Royal Oaks Blvd. / S. Royal Oaks Blvd.*	Liberty Pike	Mack Hatcher Pkwy.	Bike Lanes	2.1	$50,000
Seaboard Lane	Mallory Lane	Aspen Grove Drive	Bike Lanes	1.7	$71,000
TVA Easement	N. Carothers Rd.	Northern Boundary	Multi-Use Path	2.4	$1,285,000
Wilson Pike*	Northern Boundary	McEwen Drive	Bike Lanes**	0.5	$13,000
Wilson Pike*	McEwen Drive	Southern Boundary	Bike Lanes**	2.6	$62,000
New Road*	North Chapel Road	Highway 96	Bike Lanes	0.7	$17,000
New Road*	Carters Creek Pike	Coleman Road	Bike Lanes	2.2	$53,000
New Road*	Del Rio Pike	Nolen Lane	Bike Lanes	1.1	$27,000
New Road*	Del Rio Pike	Highway 96 W.	Bike Lanes	2.1	$50,000
New Road*	Western Boundary	Hillsboro Road	Bike Lanes	2	$48,000
New Road*	N. Chapel Road	Charity Drive Extension	Bike Lanes	0.6	$15,000
TOTAL COST					**$24,759,000**

*Part or all of this roadway segment is recommended to be improved in the *2003 MTPU*.
**Shoulder bike lanes should be provided.

Table 6.1. Cost Estimate for the LRBFP Recommendations (Pages 6.2—6.4)

Road Name	From	To	Facility Type	Length (Miles)	Cost
1st Avenue	Bridge Street	S. Margin Street	Signed Shared Roadway	0.4	$4,000
3rd Avenue	Bridge Street	Main Street	Signed Shared Roadway	0.1	$2,000
5th Avenue	Bridge Street	W. Main Street	Signed Shared Roadway	0.1	$2,000
5th Avenue	W. Main Street	S. Margin Street	Signed Shared Roadway	0.2	$3,000
7th Avenue	Columbia Pike	5th Avenue	Signed Shared Roadway	0.1	$2,000
Boyd Mill Avenue (West)*	Highway 96 W.	Downs Boulevard	Bike Lanes	0.6	$17,000
Bridge Street	5th Avenue	3rd Avenue	Signed Shared Roadway	0.2	$3,000
Bridge Street	3rd Avenue	1st Avenue	Signed Shared Roadway	0.1	$2,000
Carlisle Lane	Del Rio Pike	Highway 96 W.	Bike Lanes	0.7	$20,000
Carothers Parkway*	Moores Lane	Liberty Pike	Multi-Use Path	3.1	$1,660,000
Carothers Parkway	Quail Hollow Court	Highway 96	Multi-Use Path	0.2	$108,000
Church Street	1st Avenue	5th Avenue	Signed Shared Roadway	0.3	$3,000
Columbia Avenue*	Southern Boundary	Downs Boulevard	Bike Lanes**	5.5	$207,000
Columbia Avenue	Downs Boulevard	5th Avenue	Signed Shared Roadway	1.1	$15,000
Cool Springs Blvd.**	Mack Hatcher Pkwy.	Frazier Road	Multi-Use Path	1.1	$609,000
Del Rio Pike	Carlisle Lane	Poplar Grove Grade	Bike Lanes	0.7	$17,000
Del Rio Pike**	East Del Rio Pike Split	Hillsboro Road	Bike Lanes	0.4	$11,000
Downs Boulevard	Columbia Avenue	Highway 96 W.	Bike Lanes	2.7	$64,000
Franklin Road*	Northern Boundary	Liberty Pike	Bike Lanes**	3.5	$83,000
Franklin Road	Liberty Pike	1st Avenue	Signed Shared Roadway	0.3	$3,000
Frazier Road	Cool Springs Blvd.	Mallory Lane	Multi-Use Path	0.3	$162,000
Gen. Geo. Patton Dr.	Northern Boundary	Mallory Station Rd.	Bike Lanes	0.6	$26,000
Goose Creek Bypass*	Columbia Avenue	Peytonsville Road	Bike Lanes	3.5	$132,000
Goose Creek Bypass*	Peytonsville Road	Long Lane	Wide Outside Lanes	0.4	$10,000
Goose Creek Bypass*	Long Lane	Eastern Boundary	Bike Lanes	0.5	$20,000
Highway 96	Mack Hatcher Pkwy.	S. Margin Street	Wide Outside Lanes	1.3	$16,000
Highway 96 W.*	Western Boundary	7th Avenue	Bike Lanes**	4.3	$162,000
Highway 96 W.	7th Avenue	5th Avenue	Signed Shared Roadway	0.1	$2,000
Horton Lane*	Boyd Mill Avenue	Winberry Drive	Bike Lanes	0.3	$9,000
Lewisburg Avenue*	Harpeth River	Southern Boundary	Bike Lanes**	5.3	$125,000
Liberty Pike	Franklin Road	Liberty Road	Signed Shared Roadway	2.4	$27,000
Liberty Pike Extension*	Eastern Terminus	Wilson Pike	Bike Lanes	0.7	$17,000
Liberty Road	Liberty Pike	McEwen Drive	Signed Shared Roadway	0.6	$7,000

*Part or all of this roadway segment is recommended to be improved in the *2003 MTPU*.
**Shoulder bike lanes should be provided.

Table 6.2. Cost Estimate for the LRBFP—Phase I Recommendations

Road Name	From	To	Facility Type	Length (Miles)	Cost
Mack Hatcher Pkwy. (Existing)	Columbia Avenue	Hillsboro Road	Multi-Use Path	5.7	$3,051,000
Main Street	3rd Avenue	1st Avenue	Signed Shared Roadway	0.2	$3,000
W. Main Street	Downs Boulevard	5th Avenue	Signed Shared Roadway	1.6	$19,000
Wilson Pike*	Northern Boundary	McEwen Drive	Bike Lanes**	0.5	$13,000
Wilson Pike*	McEwen Drive	Southern Boundary	Bike Lanes**	2.6	$62,000
TVA Easement	N. Carothers Rd.	Northern Boundary	Multi-Use Path	2.4	$1,285,000
TOTAL COST					**$7,983,000**

*Part or all of this roadway segment is recommended to be improved in the *2003 MTPU*.
**Shoulder bike lanes should be provided.

Table 6.2. Cost Estimate for the LRBFP—Phase I Recommendations

accommodations if access is not fully controlled. Bicycles are permitted to operate at each end of the bridge if it is determined that bicycles can be accommodated at a reasonable cost. Bridge projects must be incorporated into the MPO's TIP. A twenty percent funding match is required by this program.

CONGESTION, MITIGATION, AND AIR QUALITY IMPROVEMENT PROGRAM (CMAQ)

Funds are available for projects that will help attain National Ambient Air Quality Standards (NAAQS) identified in the 1990 Federal Clean Air Act Amendments. Projects must come from jurisdictions in non-attainment areas. Eligible projects include bicycle and pedestrian transportation facilities intended for transportation purposes, bicycle route maps, bicycle-activated traffic control devices, bicycle safety and education programs, and bicycle promotional programs. A twenty percent funding match is required to receive CMAQ funds.

FEDERAL LANDS HIGHWAY PROGRAM FUND

The Federal Lands Highway Program Fund is under the discretion of the appropriate Federal Land Agency or tribal government. This discretionary program provides funding for any type of transportation project, including bicycle and pedestrian-related projects that are within, provide access to, or are adjacent to public lands. Facilities must be located and designed pursuant to an overall plan developed by each MPO and state and incorporated into the MPO's TIP. No matching funds are required to receive assistance through this program.

HAZARD ELIMINATION AND RAILWAY-HIGHWAY CROSSING PROGRAMS

Ten percent of STP funds are reserved for the Hazard Elimination and Railway-Highway Crossing Programs. The Hazard Elimination Program provides funds for activities that resolve safety problems at hazardous locations and sections, and that resolve roadway elements which may constitute a danger to motorists, pedestrians, and bicyclists. The Railway/Highway Crossings Program provides funds for safety improvements to reduce the number of fatalities, injuries, and crashes at public grade crossings. A ten percent funding match is required by these programs.

HIGHWAY SAFETY, RESEARCH, AND DEVELOPMENT FUND

This program provides funding for research on all phases of highway safety and traffic conditions. Uses include training and education of highway safety personnel, research fellowships in highway safety, development of improved accident investigation procedures, emergency service plans, and demonstration projects. Other uses include improving pedestrian safety through education, police enforcement, and traffic engineering. Projects must be incorporated into the MPO's TIP in order to be eligible for this program. Also, a funding match of twenty-five percent is required.

JOB ACCESS AND REVERSE COMMUTE GRANT PROGRAM

This program may provide funding for bicycle-related services that are intended to transport welfare recipients and eligible low-income individuals to and from jobs and other employment-related activities. A fifty percent funding match is required by this program.

MASS TRANSIT CAPITAL GRANTS

This discretionary funding program is used to finance mass transit systems, especially rail systems in urbanized areas with populations over 50,000. Projects include station access, bicycle and pedestrian access, American with Disabilities Act (ADA) projects, implementation of shelters, bicycle parking facilities, bicycle racks, and other equipment for transporting bicycles on transit vehicles. A ten percent funding match is required for bicycle projects, and a five percent funding match is required for ADA projects.

MASS TRANSIT FORMULA GRANTS

This program provides Formula grants for mass transportation capital and operating expenses. Eligible projects include construction, maintenance, improvement, and acquisition of transit facilities. Access projects for bicycles are also eligible. This program requires a ten percent funding match.

NATIONAL RECREATIONAL TRAILS PROGRAM (RTP) FUND

This program provides funding for recreational trails for bicyclists, pedestrians, and other non-motorized and motorized users. Projects must be consistent with a Statewide Comprehensive Outdoor Recreation Plan (SCORP). Projects include development of urban trail links, maintenance of existing trails, restoration of trails damaged by use, trail facility development, provision of access for people with disabilities, administrative costs, environmental and safety education programs, acquisition of easements, fee simple title for property, and construction of new trails. States are required to use a portion of their fuel tax revenue for off-highway recreation purposes. A twenty percent funding match is required by the RTP program. This amount may be reduced to five percent on a discretionary basis. Other federal program funds may be used to provide the matching funds if the project is also eligible to receive funding through the other federal programs.

NATIONAL HIGHWAY SAFETY ACT

The Highway Safety Program is a non-capital safety project grant program under which states may apply for funds for certain approved safety programs and activities. There is a priority list of projects for which an expedited funding mechanism has been developed. bicycle and pedestrian safety programs have been included on this list. Eligible states must adopt a Highway Safety Plan (HSP) reflecting state highway problems. Eligible projects include pedestrian and bicycle safety programs, program implementation, and identification of highway hazards. A twenty percent funding match is required by this program.

NATIONAL HIGHWAY SYSTEM FUND (NHS)

NHS funds are reserved for projects that provide for an interconnected system of principal arterial routes. The goal of the NHS is to provide access to major population centers, international border crossings, and transportation systems. Other goals include meeting national defense requirements and serving interstate and interregional travel. This travel includes access for bicyclists and pedestrians. Bicycle and pedestrian projects adjacent to any highway on the National Highway System, including interstate highways, are eligible to receive funding. However, these facilities must be located and designed pursuant to an overall plan developed by each MPO and state and incorporated into the MPO's TIP.

SCENIC BIKEWAYS PROGRAM FUND

This program provides funding for the planning, design, and development of a State Scenic Byways Program. Priority is given to designated scenic byways, proposals with specific intent, and projects established under partnerships. Funds may be used for the construction of bicycle and pedestrian facilities along highways, including bicycle/pedestrian access, safety improvements, and rest areas. The Scenic Bikeways Program Fund requires a twenty percent funding match.

SCHOOLS AND ROADS GRANTS TO STATES

These funds are used for public roads and schools that are located in the same county as a national forest. The program's intention is to maintain county roads that lead to forest service roads. Matching funds are not required by this program.

SURFACE TRANSPORTATION PROGRAM (STP)

The Surface Transportation Program is a block grant fund. Funds are used for roads, bridges, transit capital, and pedestrian and bicycle projects. These projects include bicycle transportation facilities, bicycle parking facilities, equipment for transporting bicycles on mass transit facilities, bicycle-activated traffic control devices, preservation of abandoned railway corridors for bicycle and pedestrian trails, and improvements for highways and bridges. Funds can also be used for "non-construction" projects that benefit bicyclists and pedestrians, such as maps, brochures, and public service announcements. In order to receive STP funds for bicycle and pedestrian-related projects, a twenty percent funding match is required. TEA-21 allows the transfer of funds from other TEA-21 programs to the STP Fund.

TRANSIT ENHANCEMENT ACTIVITY

This is a new program created by TEA-21. One percent of the Urban Area Formula Transit Grants are reserved for the Transit Enhancement Activity program. These funds can be used for, among other things, bicycle and pedestrian access to mass transportation, including bicycle storage facilities and installing equipment for transporting bicycles on mass transportation vehicles. A five percent funding match is required for this program.

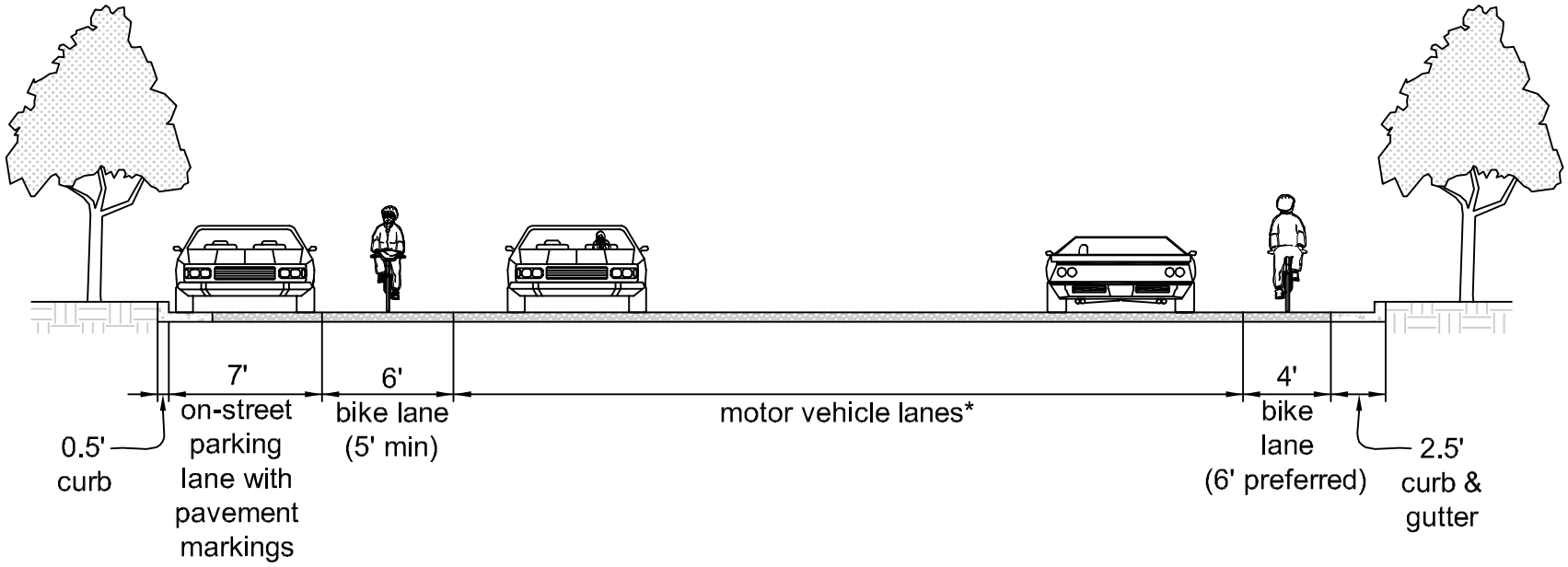
TRANSPORTATION ENHANCEMENTS PROGRAM (TE)

Ten percent of STP funds are reserved for the TE Program. In order to receive TE funding, projects must have a direct relationship to the intermodal transportation system through function, proximity, or impact. This program has twelve activities that are eligible for funding. Two Enhancement Activities are specifically bicycle related. One of these activities is the provision of facilities for bicyclists and pedestrians. The other activity is the preservation of abandoned railway corridors, which includes the conversion and use thereof for bicycle or pedestrian trails. The TE Program requires a twelve percent funding match.

APPENDIX A

BICYCLE & PEDESTRIAN FACILITY CROSS-SECTIONS

BICYCLE FACILITY CROSS-SECTIONS



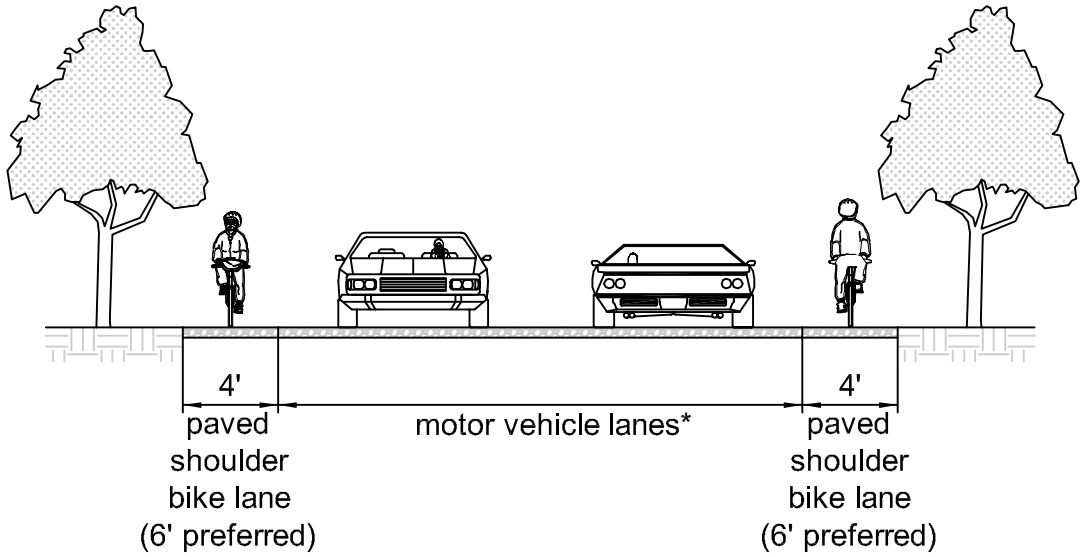
* Width varies depending on the number of travel lanes and the roadway classification. See the *2003 MTPU* for roadway cross-sections.

Transportation Consultants, LLC

N

No Scale

Bike Lanes on Roadways with Curb & Gutter



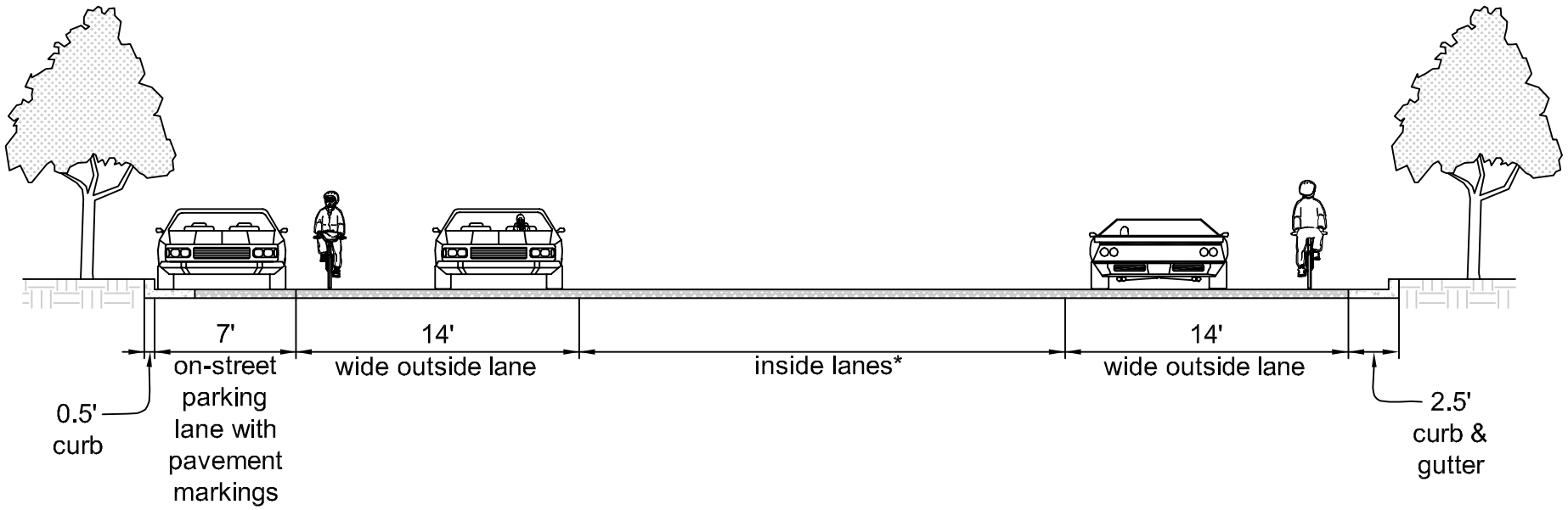
* Width varies depending on the number of travel lanes and the roadway classification. See the *2003 MTPU* for roadway cross-sections.

Transportation Consultants, LLC

N

No Scale

Shoulder Bike Lanes



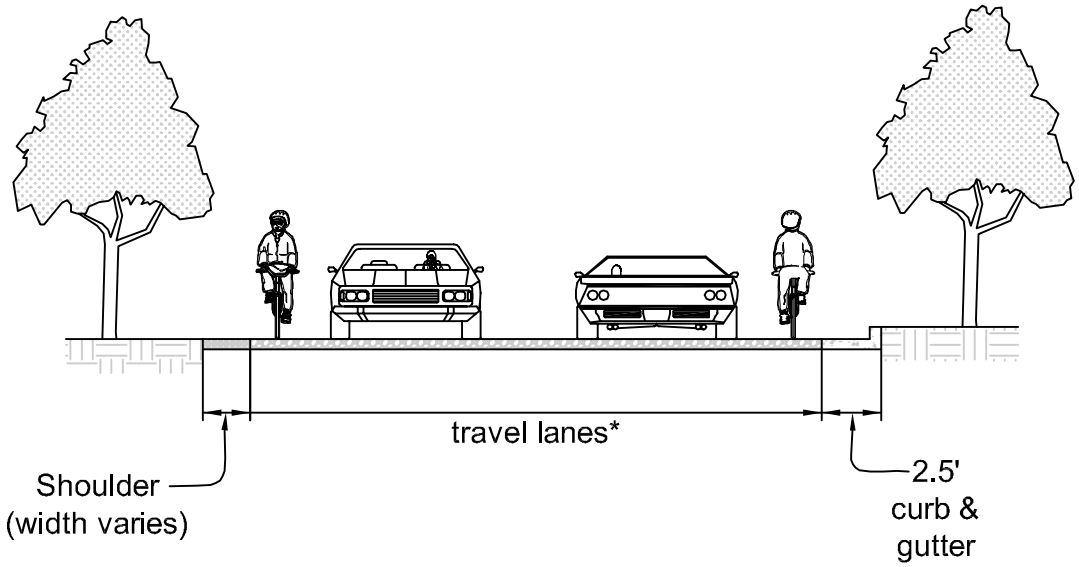
* Width varies depending on the number of travel lanes and the roadway classification. See the *2003 MTPU* for roadway cross-sections.

Transportation Consultants, LLC

N

No Scale

Wide Outside Lanes



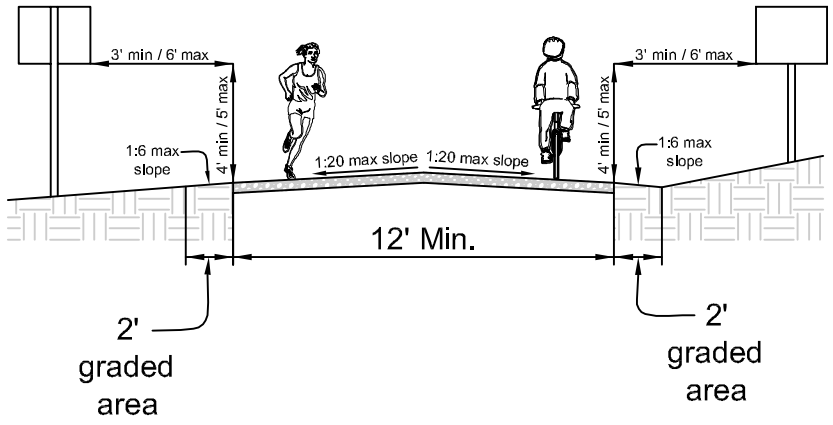
* Width varies depending on the number of travel lanes and the roadway classification. See the *2003 MTPU* for roadway cross-sections.

Transportation Consultants, LLC

N

No Scale

Signed Shared Roadway



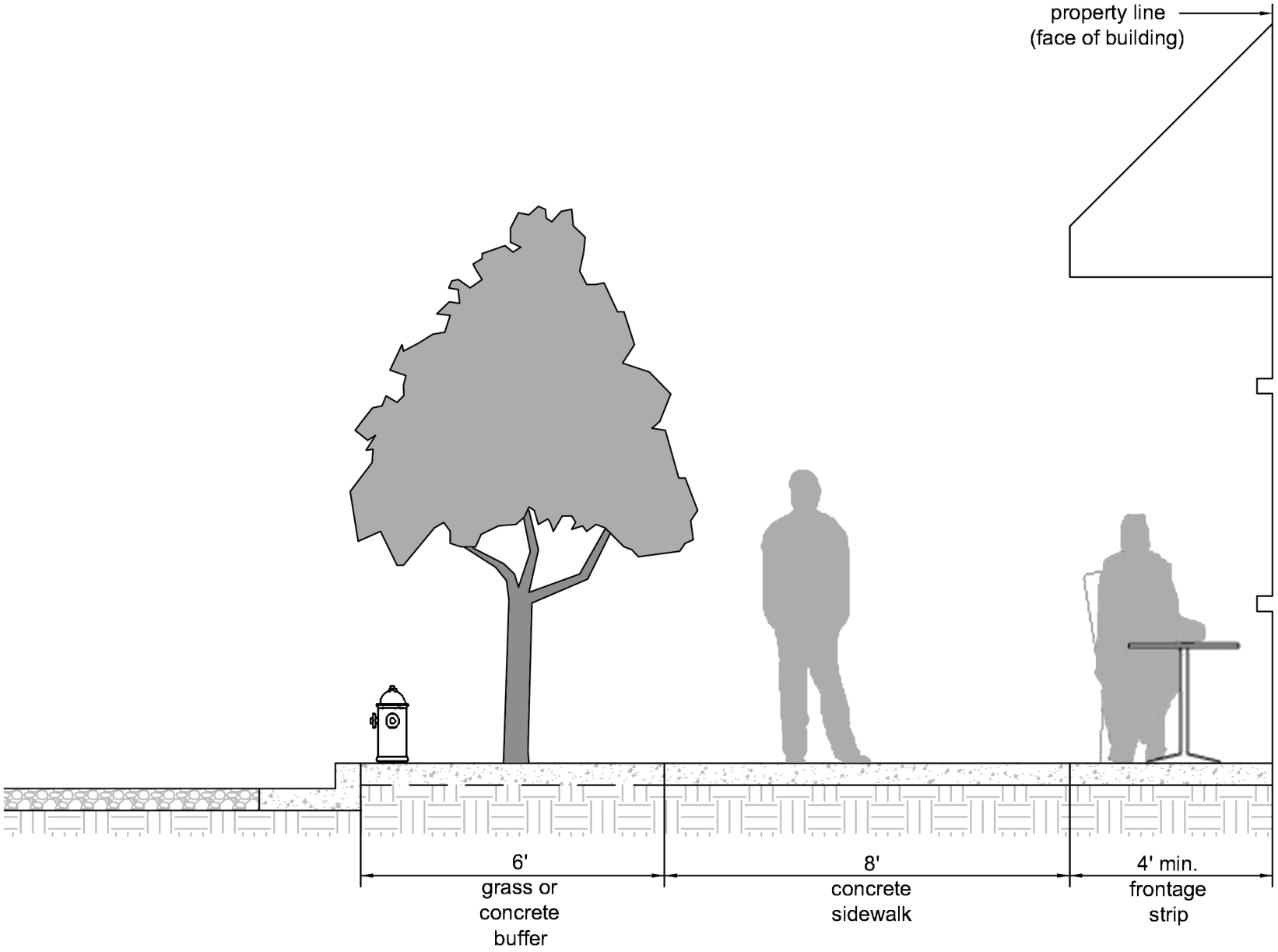
Transportation Consultants, LLC

N

No Scale

Multi-Use Path

PEDESTRIAN FACILITY CROSS-SECTIONS

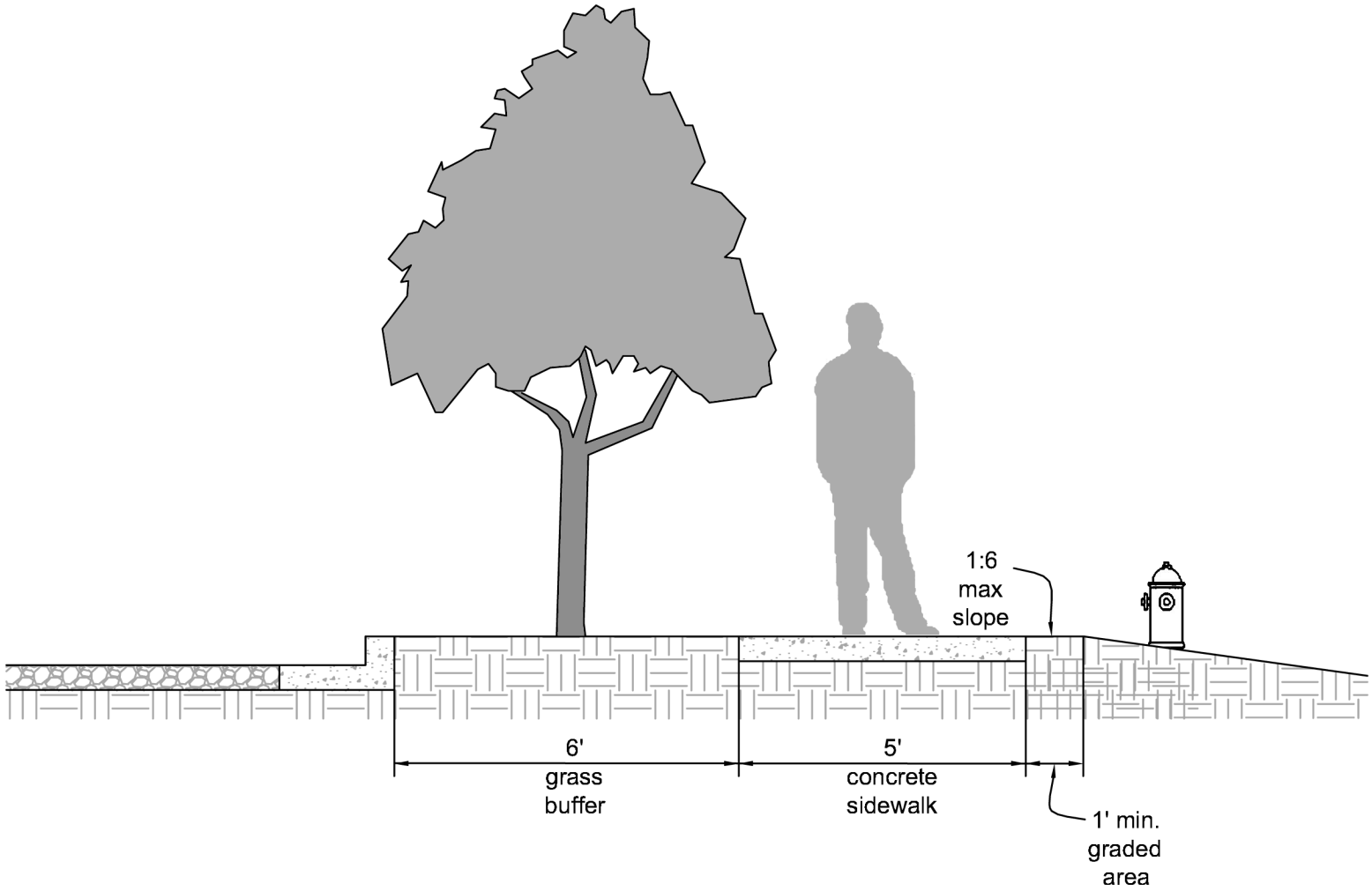


Transportation Consultants, LLC

N

No Scale

Sidewalks Along Arterial Roadways with Curb & Gutter (Urban)

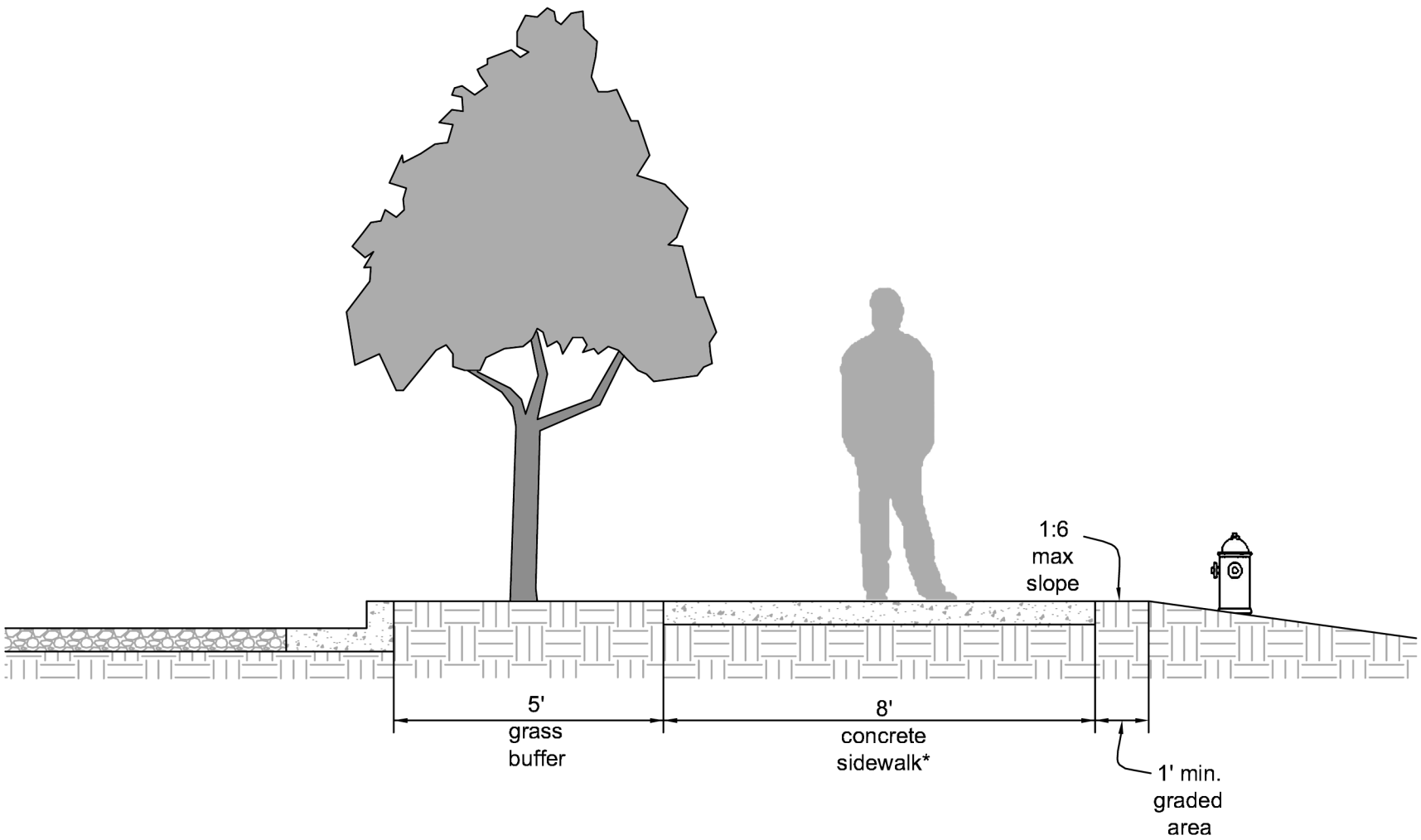


Transportation Consultants, LLC

N

No Scale

Sidewalks Along Arterial Roadways with Curb & Gutter (Suburban)



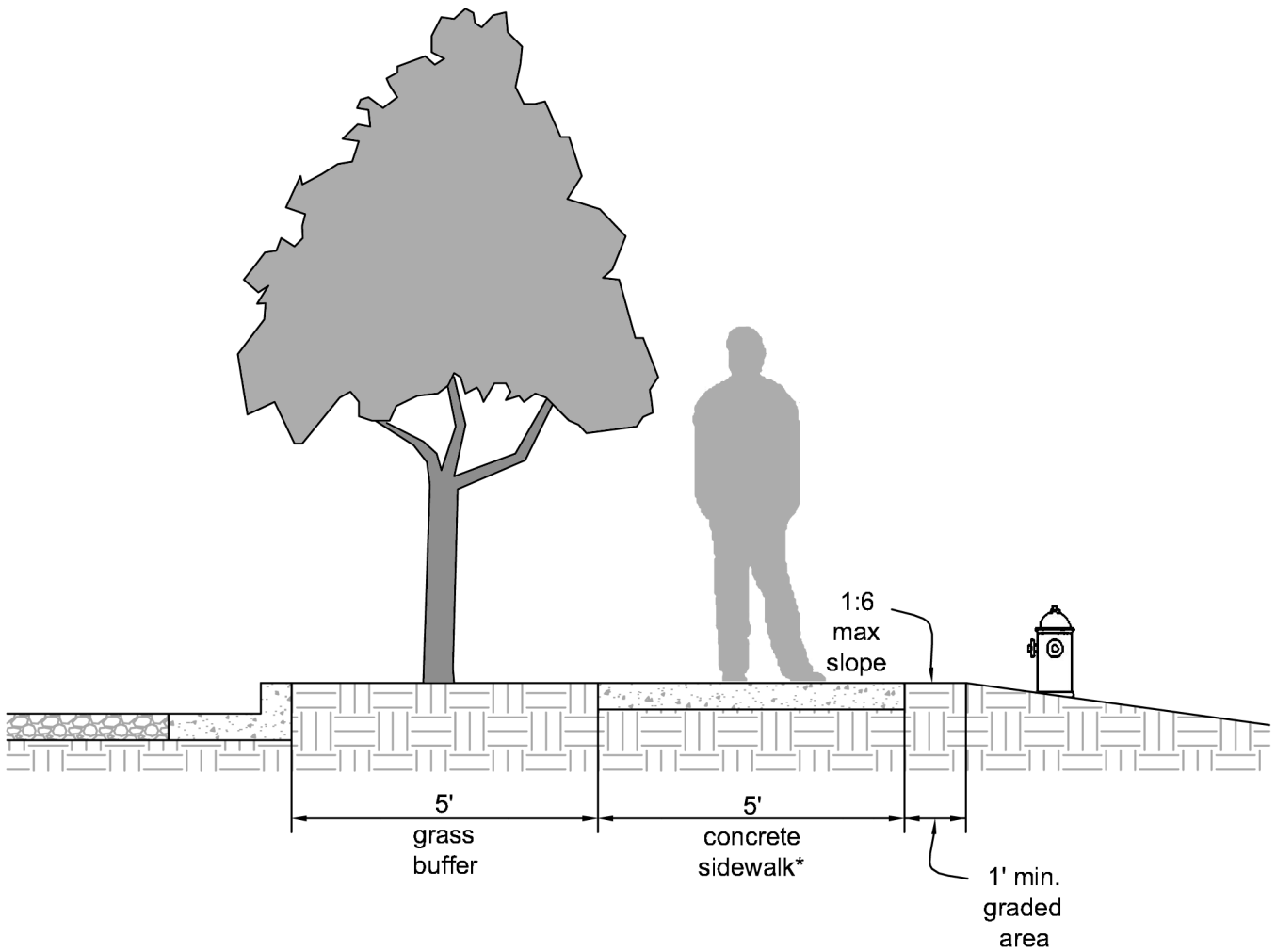
*Sidewalks are not required in industrial or rural areas.

Transportation Consultants, LLC

N

No Scale

Sidewalks Along Collector Roadways with Curb & Gutter (Commercial)



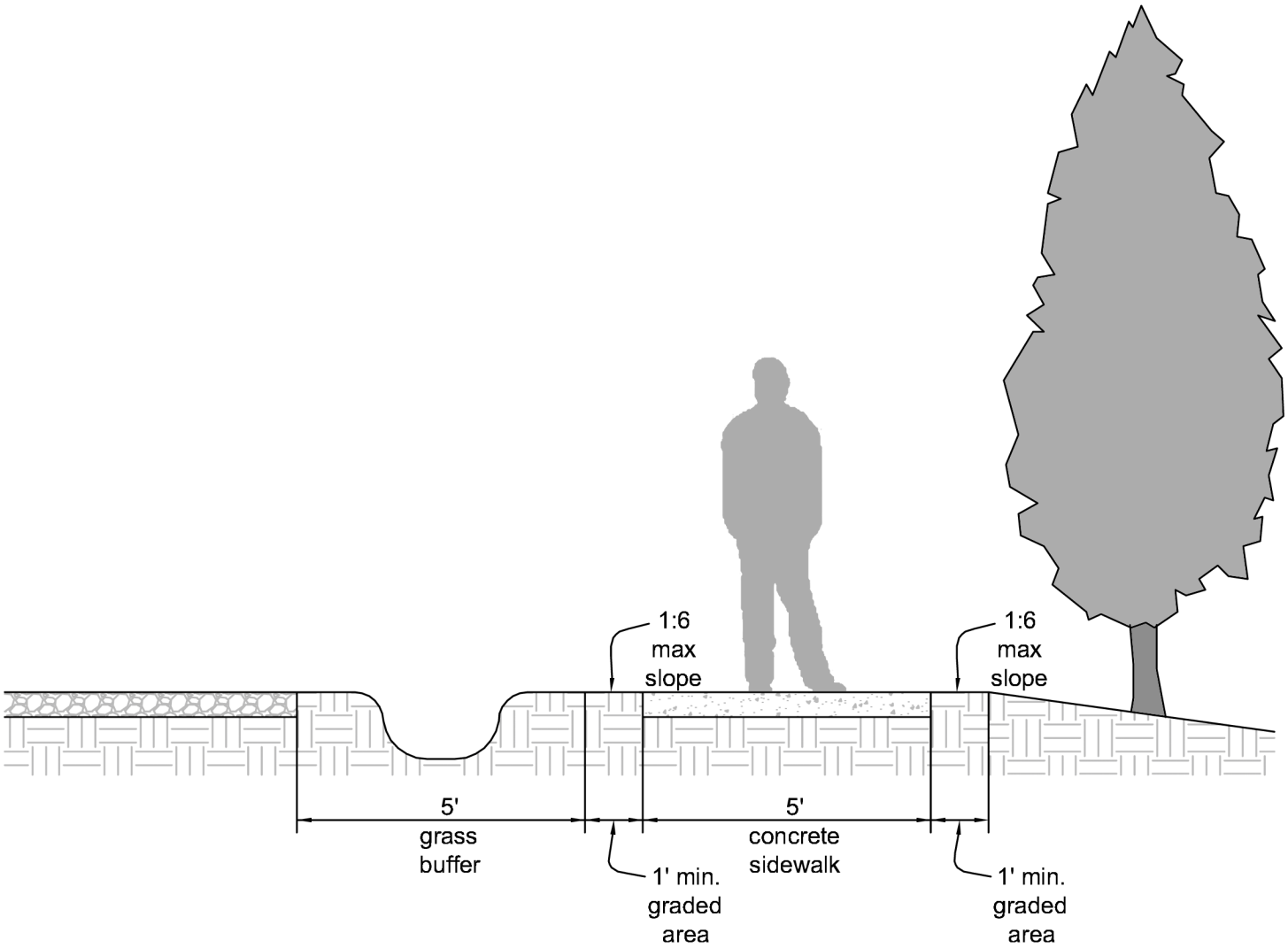
*Sidewalks are not required in rural areas.

Transportation Consultants, LLC

N

No Scale

Sidewalks Along Local Roadways with Curb & Gutter
and
Sidewalks Along Collector Roadways with Curb & Gutter (Residential)



Transportation Consultants, LLC

N

No Scale

Sidewalks Along Roadways with Ditches

APPENDIX B

SIDEWALK PRIORITY INDEX CALCULATION WORKSHEET

SIDEWALK PRIORITY INDEX
CALCULATION SHEET

STREET NAME			
FROM			
TO			
FACTORS		**VALUE**	**SCORE**
ZONING FACTORS			
HR - High Residential PR - Planned Residential OR - Office Residential CC - Central Commercial PO - Planned Office PC - Planned Commercial		10	
MR - Medium Residential GR - General Residential NC - Neighborhood Commercial GO - General Office GC - General Commercial		8	
IC - Interstate Commercial LI - Light Industrial		6	
ER - Estate Residential LR - Low Residential HI - Heavy Industrial		0	
TRIP GENERATOR - 0.5 MILE RADIUS FACTORS			
Schools	Elementary/Middle School	10	
	High School	7	
Library/Civic Building		5	
Park/Greenway		6	
College/ University		5	
Senior/Assisted Living Housing		8	
Public Housing		10	
Transit Route		7	
OTHER FACTORS			
Arterial Roadway		4	
Collector Roadway		2	
Missing sidewalk segment, 0.25 mi or less in length, that connects to an existing sidewalk at both ends of the segment		6	
GRAND TOTAL			